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***Digestive Coefficients of Poultry
Feeds and Rapidity of Digestion
and
Fate of Grit in the Fowl***

B. F. KAUPP and J. E. IVEY

**Animal Industry Division
North Carolina Agricultural Experiment Station
Raleigh**



**NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION
Conducted Jointly by The State Department of Agriculture and
The North Carolina State College of Agriculture and Engineering
Raleigh**

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THE DIGESTIVE COEFFICIENTS OF POULTRY FEEDS AND RAPIDITY OF DIGESTION AND FATE OF GRIT IN THE FOWL

BY B. F. KAUPP AND J. E. IVEY, NORTH CAROLINA EXPERIMENT STATION,
RALEIGH, N. C.

HISTORICAL REVIEW

The absence of definite standards and coefficients of digestibility of different feeds for poultry has been a serious drawback to the best work of practical feeding tests. The alimentary canal of birds is quite different from that of mammals and it is desirable to determine if there is any difference in digestive coefficients between fowls and mammals. The fact that the undigested parts of the food and the urinary excretions are eliminated from the body together makes a serious obstacle in the way of protein digestion determinations with fowls and greatly increases the amount of analytical work to be done.

Some digestive experiments with poultry were done by Bartlett¹. The length of time of feeding in these experiments was twelve to fourteen days, being divided into two periods, a preliminary period of five to seven days, when the amount the bird would eat was determined and the alimentary canal freed from other food, and a collection period. The droppings were collected in a specially constructed bag attached to the posterior parts of the bird and held in place by a kind of harness. The feeding was done at regular hours morning and evening. The droppings were collected at the same time and placed in glass jars and kept covered with alcohol to prevent fermentation. Later the alcohol was evaporated off on a steam bath, then dried at 60 degrees C. to air dry conditions.

Bartlett concludes after conducting his feeding experiments with different rations that "the indications are that the digestive coefficient of most nutrients for poultry are not materially different from other animals". "Unlike ruminants they digest very little crude fiber, hence coarser fodder carrying much of this material is of but little value. The nutrients of wheat do not seem to be as well handled as most other concentrated grains, the ether extract showing a particularly low coefficient. Likewise bran, one of the wheat by-products, shows low digestibility in organic matter including ether extract and nitrogen-free-extract. Its bulky and coarse condition has brought it much into favor to feed with more concentrated materials and it often makes as much as fifty per cent of the mixture used in mashes."

"The mixture of equal parts corn meal and fine cut early clover is sufficiently bulky to feed with concentrates and is more digestible. An exclusive diet of wheat has a deranging effect upon the digestive system of the birds." He further concludes that corn is the most valuable grain for poultry, being high in digestibility and palatability.

The feeds tested were wheat bran, corn meal, gluten feed, beef scrap, linseed meal, corn, cracked corn, cut clover, oats, rolled oats, wheat both hard and soft.

¹ Bartlett, J. M., Digestive Experiments with Poultry, Bul. 184, Me. Exp. Sta., 1910.

PLASBY

Corn showed a higher digestibility than any other grain tested.

Wheat bran showed a low digestibility.

A mixture of equal parts fine cut clover and corn meal is more digestible and is a more economical feed than bran.

Corn compares favorably with oats as a grain feed for fowls. The ether extract of wheat has a low digestive coefficient.

Crude fiber is but very little digested and evidently is of but little use in a ration for poultry except to give bulkiness.

The mixing of about seven per cent of bone ash with a ration consisting wholly of vegetable matter gave slightly higher average digestive coefficient than when the mixture was fed without it.

Kalugine² in 1897 conducted digestion trials with peas, buckwheat, wheat, and barley. "Hens digest the crude protein of peas and barley in about the same proportions as has been observed in experiments with farm animals. The assimilation of crude protein of wheat and buckwheat is inferior to that found in the other two grains. In their capacity to utilize fat, fowls in some respects resemble swine and in other respects herbivora.

Fields and Ford³ in 1900 conducted digestion trials with kafir corn, corn, and cowpeas. The digestion coefficients of kafir corn and corn are higher when fed whole than when ground. The reverse is true of cowpeas. The percent of digested crude protein, nitrogen-free-extract, and ether extract is generally higher in kafir corn than in cowpeas.

Lehmann⁴ conducted trials in 1901 with wheat and peas. Fiber was found indigestible. The assimilation of both crude protein and fat of wheat is much less than that of peas. The reverse is true of nitrogen-free-extract. The digestible coefficients by poultry are more comparable to those of swine than to those by farm animals.

Paraschtschuk⁵ in 1902 conducted trials with corn for hens and cocks. "Digestion by poultry does not differ widely from that of other animals. In their ability to digest fiber, poultry resembles swine more than they do ruminants or horses. In their ability to digest ether extract poultry most closely resembles ruminants. They are lowest in order in ability to utilize nitrogen-free-extract."

Prior to 1904 digestion trials were reported for about 20 feeds on poultry. Duplicate trials were reported for only three feeds. These are corn, peas, and barley.

Brown⁶ in 1904 gives the results of sixteen digestion trials with nine hens and one cock extending over a period varying from six to thirteen days. The feeds used were corn, oats, wheat, and meat. Crude protein and nitrogen-free-extract are assimilated in much greater proportions in corn than in oats. Wheat falls between the two in these respects. The digestibility of crude fat of wheat is conspicuously less than of corn and oats, which fact may bear relation to the unfavorable results that follow sole wheat diet. Chickens eat much more of corn than of oats and the nutritive superiority of corn is manifest in an increased body weight of these chickens in the corn test in contrast with a decreased body weight of chickens in the oat test. According to the availability of the nutrients, these three grains vary with respect to low cost in order of corn, oats, and wheat.

² Kalugin, J. Ueber die Wirkung feine Grandes awf die verdanlich keit der Nohrstoffe der Hirse bei Huhnern. Fuhling's landwirtsch. Ztg. Leipzig, 46, Heft 3, I Feb. Pp 85-86, 1897.

³ Fields and Ford, Bul. 46, Okla. Exp. Sta., 1900.

⁴ Lehmann, F. Futterungsveruche beitr. Ernahrung von Geflugee. Deutschland wirtsch. Gresse Berlin, 28 J., No. 39, 118, Mar. pp 339-340, 1901.

⁵ Paraschtschuk, Simon. Die Verdauung des mais hei Huhnern, Journ f. Zandwirt Sch., Berlin 50. J., Hebt 1, 9 mai, pp 15-32, 1902.

⁶ Brown, E. W., Bul. 56, U. S. Dept. of Agri., B. A. I. Digestion Experiments with Poultry, 1904.

The digestive organs of the fowl differ greatly from that of mammals⁷. The food passes from the mouth through the pharynx and first portion of the esophagus to the crop. The food here becomes moistened, then passes through the second portion of the esophagus to the proventriculus where it is soaked in a strong acid solution. It then passes into the gizzard and is ground. Thus ground and soaked with acid and a ferment pepsin it passes to the duodenum where pepsin digestion is completed. The content of the duodenum, about fourteen inches long, is strongly acid. At the lower end of the duodenum the bile and pancreatic secretion is poured out and the reaction gradually becomes less acid till the caeca, two in number, are reached. The liquid flowing into the large intestine, which in the averaged sized hen is about four and one-half inches long, now by reverse peristalsis of this portion forces the liquid forward, at the same time the caecal valves extend across the mouth of the free portion of the small intestine and the content is thus forced into the caeca. This can be demonstrated by forcing liquid through a syringe into the large intestine.

Since the urine and the undigested food accumulate in the cloaca and are voided together in the fowl, a means must be used in determining the uric acid content in analyses of the excreta of fowls, a factor not present in digestion work in mammals since in mammals the urine is eliminated from the body through another channel from the undigested food channel or bowel.

Avian urine has a relatively small water content which rapidly evaporates and leaves a white flaky mass of uric acid so commonly seen in the droppings of birds. The urea, which makes up the major part of the nitrogenous end-products of mammalian urine, is highly soluble, whereas the uric acid making up the bulk of the nitrogenous end-product in avian urine, is relatively insoluble. The insolubility of the uric acid is an important factor in making the uric acid determinations and complicates the test. Mammalian urine is rich in chlorides, phosphates, sulphates, calcium, and magnesium. Avian urine contains relatively none of these. The avenue of escape for the salts must be in another direction and it is interesting to note that the yolk and shell of the egg contains considerable quantities of such salts.

From a review of literature at hand on this subject it would appear that fowls are apparently most efficient in digesting the nutrients in the order of nitrogen-free-extract, protein, and fat. They digest relatively little or no fiber.

THE PROBLEM

The purpose of the work is to determine the rapidity of digestive processes in the fowl and to make sufficient digestive coefficient studies of poultry feeds which, together with those already available, would be sufficient for a tentative table of digestible nutrients of poultry feeds based on digestion experiments with poultry, to determine the ash intake and ash outgo and its effect on the digestive coefficients of feeding stuffs of poultry, and to determine the fate of grit in the fowl.

Time Required for Food to Pass Through the Entire Intestinal Tract of Fowls

Fowls of the American breeds were used in these experiments. Only hens were to be tested, and birds two to three years of age were selected.

The birds were kept in small wire coops eighteen inches square with one inch chicken netting floor. The coop stood on a tin pan slightly larger than the floor of the coop. This pan was to catch the excreta as it was voided.

Ground feeds such as wheat middlings and corn meal were used in which was in-

⁷ Kaupp, B. F., *Anatomy of the Domestic Fowl*, published by W. B. Saunders Co., Philadelphia, Pa., 1918.

corporated a material that would stain the digestive content and indicate just when the food passed out of the body. The materials, or indicators were lampblack, methylene blue, and gentian violet.

DATA

Test No. 1: White Plymouth Rock hen, leg band No. B36, weight 5.9 pounds.

8 a. m. given 20 gms. wheat middlings mixed with water and lampblack.

2 p. m. first evacuation, a trace of lampblack appeared.

4 p. m. still only a trace of lampblack appears, fed 20 gms. wheat middlings without lampblack.

6 p. m. evacuation showing excreta decidedly black.

8 a. m. second day 20 gms. middlings and water given.

8 a. m. third day—48 hours—excreta showed slight tinge of lampblack on the outer surface but none on the inner particles. 20. gms. middlings mixed with water given. 6 p. m. 20 gms. middlings mixed with water given.

8 a. m. fourth day—72 hours—excreta normal. No trace of lampblack.

Lampblack appeared in six hours and disappeared in seventy-two hours.

Test No. 2: White Plymouth Rock hen, leg band No. 142, weight 6.8 pounds.

8 a. m. given 20 gms. wheat middlings mixed with water, lampblack.

4. p. m. fed 20 gms. wheat middlings with water and lampblack.

6. p. m. first excreta passed. Lampblack stained excreta.

8 a. m. second day, 20 gms. middlings given.

6 p. m. 20 gms. middlings given. Excreta still black.

8 a. m. third day 20 gms. middlings given. Excreta nearly normal, only small amount on the outside, inside of mass not containing lampblack.

6 p. m. 20 grams middlings given.

8 a. m. fourth day—72 hours—excreta normal.

In this case the first excreta voided after the feeding of the lampblack was at 6 p.m., or ten hours. At this time lampblack in small amounts appeared. All lampblack had disappeared at the end of 72 hours.

Test No. 3: White Plymouth Rock hen, leg band No. B10, weight, 6.14 pounds.

7 a. m. fed 10 gms. wheat middlings mixed with water and lampblack.

1 p. m. first evacuation. The excreta was black.

2 p. m. second evacuation. Excreta black.

7 a. m. fourth day. Excreta free from black.

Lampblack appeared in six hours and disappeared in seventy-two hours. This test was run with a broody hen.

Test No. 4: White Plymouth Rock hen, leg band No. 473, weight 5.14 pounds.

7 a. m. fed 10 gms. wheat middlings mixed with water and lampblack.

4 p. m. fed 20 gms. middlings, no lampblack. No excreta was voided on the first day after feeding with lampblack. Excreta showed black at 7 a. m. second day. Excreta were also voided at 7:30 second day which was also black. This bird acted as though constipated and no further excreta were voided until morning of the fourth day or seventy-two hours. No lampblack was present in these last excreta.

Owing to the fact that no excreta were voided on the day of feeding of the middlings and lampblack it is impossible to tell how long it required for the lampblack to pass the entire length of the digestive tract. The fact that the excreta were free from lampblack on the fourth day and after the seventy-two hours showed this test to be in line with those above. This test was run with a broody hen.

Test No. 5: White Plymouth Rock hen, leg band No. B148, weight 6 pounds.

7 a. m. fed 10 gms. wheat middlings mixed with water and lampblack.

4 p. m. fed 20 gms. middlings.

7 p. m. fed 20 gms. middlings.

9 p. m. first excreta voided. Excreta black.

7 a. m. fourth day excreta after 72 hours normal. No lampblack.

This test was run on a broody hen. First excreta voided in 14 hours and showed lampblack. Lampblack traces disappeared after 72 hours.

Test No. 6: Single Comb White Leghorn hen, laying condition, leg band No. 34, weight 2.8 pounds.

7 a. m. fed 20 gms. wheat middlings mixed with water and lampblack.

10:30 a. m. first excreta voided. Excreta black.

11:20 a. m. excreta voided, same color as above

7 a. m. fourth day after 72 hours excreta normal.

Excreta showed in three and one-half hours that food had passed the entire length of the intestinal tract.

Test No. 7: Chick, leg band No. 32, weight 2 pounds.

7 a. m. fed 10 gms. wheat middlings mixed with water and lampblack.

10:50 a. m. first excreta voided. Excreta black

7 a. m. fourth day after 72 hours excreta normal

The indicator suggests that the food passed through this two-pound broiler chick in four hours.

Test No. 8: Chick, leg band No. 36, weight 1.8 pounds.

7 a. m. 20 gms. wheat middlings given mixed with water and lampblack.

10:55 a. m. first excreta voided. Trace of lampblack.

11:40 a. m. second excreta voided. Excreta black.

7 a. m. fourth day after 72 hours excreta normal.

In this case the excreta voided indicated that the food had passed through the digestive tract in approximately four hours.

Test No. 9: Buff Plymouth Rock hen, in laying condition, leg band No. 26, weight 5.5 pounds.

7 a. m. fed 20 gms. wheat middlings mixed with water and lampblack.

10:00 a. m. first excreta voided. Excreta black.

7 a. m. fourth day, excreta normal.

The indicator showed that food had passed the entire digestive tract in three hours. An egg was laid first day of experiment.

Test No. 10: Buff Plymouth Rock hen in laying condition, leg band No. 28, weight 6 pounds.

7 a. m. fed 20 gms. wheat middlings with water and lampblack.

10:05 a. m. first excreta voided. Excreta black.

7 a. m. fourth day after 72 hours excreta normal.

The indicator showed that food passed through the intestinal tract in approximately three hours. This hen laid one egg on the first day of the experiment.

Test No. 11: Buff Plymouth Rock hen, in laying condition, leg band No. 30, weight 6 pounds.

7 a. m. fed 20 gms. wheat middlings mixed with water and lampblack.

10:00 a. m. first excreta voided. Lampblack present.

3:30 p. m. third day all traces of lampblack gone.

The hen laid an egg each of the first two days. The indicator showed that food had passed the entire length of the digestive tract in approximately three hours. It was noted that in the latter part of this experiment that the outside of the fecal mass was

black and the inside not colored. This raised the question as to whether lampblack will adhere to the intestinal mucosa and be gradually eliminated by the feces as it passes along. In the small intestines where the food is mixed by the pouring back and forth process, it evidently would be mixed with the food. However, this would not hold true in the large intestine, since the formation of the mass takes place either in the large intestine or cloaca or in both.

With these ideas in mind it was decided to try some test using aniline blue dyes which were calculated to stain the feeds and not be in a form to be carried along mechanically as in the case of lampblack.

Test No. 12: Columbian Wyandotte hen, leg band No. 26, weight 5.4 pounds.

7 a. m. fed whole corn soaked in gentian violet water. She ate 5 gms.

4 p. m. given 20 gms. soaked in gentian violet water.

7:30 a. m. second day, first evacuation. Excreta watery in consistency, greenish in color, indicating at first a tendency to constipation and later diarrhea. This test was considered unsatisfactory.

Test No. 13: Columbian Wyandotte hen, leg band No. 28, weight 5.6 pounds.

7 a. m. fed whole corn soaked in gentian violet water. She ate 4 gms. There was no evacuation during the day.

8:45 a. m. second day, first evacuation watery in consistency, greenish in color. This test was unsatisfactory for the same reason as No. 12.

Test No. 14: Columbian Wyandotte hen, leg band No. 31, weight 6 pounds.

7 a. m. fed whole corn soaked in gentian violet water. She ate 3 gms.

6 p. m. first evacuation. Greenish and water-like in consistency. The constipating effect was not so great as in the two previous cases. This test was considered unfavorable and unsatisfactory.

Test No. 15: Columbian Wyandotte hen, leg band No. 32, weight 5.7 pounds.

7 a. m. fed whole corn soaked in gentian violet water. She ate 10 gms.

9 a. m. second day, first evacuation. Feces greenish and watery. The hen appeared weak. Here again the gentian violet appeared to cause constipation followed by diarrhea apparently due to irritation of the mucosa of the bowel. This test was considered unsatisfactory.

Test No. 16: Buff Plymouth Rock hen, leg band No. 26, weight 5.8 pounds.

8:30 a. m. fed corn meal mixed with methylene blue water.

11:40 a. m. first excreta voided. The excreta were blue at this time.

7 a. m. fourth day after 72 hours excreta normal.

This was three hours and ten minutes for food to pass through the intestinal tract. There was some irritation. This bird was in laying condition.

Test No. 17: Buff Plymouth Rock hen, leg band No. 28, weight 6 pounds.

8:30 a. m. fed 35 gms. corn meal mixed with methylene blue water.

11:00 a. m. first excreta voided. Excreta were blue. There was some irritation at this time evidence by slight watery condition of the excreta.

8:30 a. m. fourth day after 72 hours all traces of the blue had disappeared.

Food passed through the digestive tract in two hours and thirty minutes. This bird was in laying condition. There was here again evidence of irritation.

Test No. 18: Buff Plymouth Rock hen, leg band No. 30, weight 5.9 pounds.

8:30 a. m. fed 8 gms. corn meal mixed with methylene blue water.

9:00 a. m. first excreta were voided. Only very slight traces of methylene blue could be detected.

4:30 p. m. second evacuation. Excreta blue. The first passage was in thirty minutes and indicated that if food is given on an empty crop and mixed with methylene blue slight staining of the food in the cloaca may occur in that

space of time. The reaction was constipation followed by looseness of the bowels as with the gentian trials. At the end of 72 hours no trace of the methylene blue could be detected.

Test No. 19: Buff Plymouth Rock hen, leg band No. 32, weight 5.7 pounds.

8:30 a. m. fed 30 gms. corn meal mixed with methylene blue water.

11:40 a. m. first excreta were passed. Excreta blue.

8:30 fourth day, after 72 hours excreta normal.

The first indication was at three hours and ten minutes. There was again evidence of irritation. The hen was in laying condition, having laid two eggs during the trials.

Test No. 20: Buff Plymouth Rock hen, leg band No. 34, weight 6.1 pounds.

8:30 a. m. fed 31 gms. corn meal mixed with methylene blue water.

12:00 m. first excreta passed. Excreta blue.

8:30 a. m. fourth day, after 72 hours excreta normal.

Indicator showed food passed entire digestive tract in three hours and thirty minutes. Hen was in laying condition. Methylene blue caused irritation.

Test No. 21: Buff Plymouth Rock hen, leg band No. 36, weight 6.3 pounds.

7 a. m. fed 7 cc. methylene blue water mixed with corn meal.

7:30 a. m. second day, first evacuation. Excreta blue.

7:30 a. m. third day, after 48 hours all blue had disappeared.

This bird was not in laying condition. The first effect was that of constipation, the first evacuation being twenty-three hours after the test meal was given.

Test No. 22: White Plymouth Rock hen, leg band No. 115, weight 6.5 pounds.

7 a. m. fed 20 gms. corn meal mixed with lampblack.

10:20 a. m. first excreta voided. Excreta black.

7 a. m. fourth day, after 72 hours excreta normal.

This hen was in laying condition, laying an egg on each of the three days of the test. The food, as indicated by the lampblack, passed the entire length of the digestive tract in three hours and twenty minutes. The hen was in laying condition.

Test No. 23: White Plymouth Rock hen, leg band No. 56, weight 5.8 pounds.

7 a. m. fed 20 gms. corn meal in which was incorporated lampblack.

12:20 p. m. first excreta were voided. Excreta black.

7 a. m. fourth day, after 72 hours excreta normal.

The first colored excreta were passed in five hours and twenty minutes. The hen was in laying condition laying each day during the test.

Test No. 24: White Plymouth Rock hen, leg band No. 100, weight 6.3 pounds.

7 a. m. fed 20 gms. corn meal mixed with lampblack.

2 p. m. first excreta passed. Excreta black.

7 a. m. fourth day, excreta normal.

The first excreta were voided in seven hours. This hen was broody. Broody hens apparently do not have as many evacuations as other hens and the quantity evacuated is greater as indicated by this hen.

Test No. 25: Partridge Plymouth Rock hen, leg band No. 112, weight 5.3 pounds.

7 a. m. fed 20 gms. corn meal in which was incorporated lampblack.

1:20 p. m. first excreta voided. Excreta black.

7 a. m. fourth day, after 72 hours excreta normal.

The first excreta indicating lampblack was voided in six hours and twenty minutes.

DISCUSSION

Of the two White Plymouth Rock hens not in laying condition one passed wheat middlings in six hours and the other in ten hours or an average of eight hours.

In the test with one Single Comb White Leghorn in laying condition the wheat

middlings passed through the intestinal tract in three and one-half hours. Of the three Buff Plymouth Rock hens in laying condition, two passed wheat middlings in three hours and the third in three hours and five minutes. Of the two White Plymouth Rock hens laying during the tests, corn meal passed through the digestive tract, one in three hours and twenty minutes and the other in five hours and twenty minutes, or an average for these two of four hours and twenty minutes. An average of the six tests with laying hens showed that food passed the entire digestive tract in three hours and forty-six minutes.

Of the three White Plymouth Rock hens that were broody, one passed the wheat middlings through the intestinal tract in six hours, the second in twenty-four hours, and the third in fourteen hours, or an average of these three of fourteen and two-thirds hours. Of two White Plymouth Rock hens in a broody condition given corn meal one passed food through the digestive tract in seven hours and the second in six hours and twenty minutes, or an average of the five broody hens of eleven hours and forty-five minutes.

Of the two chicks weighing approximately two pounds each, one passed the wheat middlings through the intestinal tract in three hours and fifty minutes and the other in three hours and fifty-five minutes, making an average of three hours and fifty-two minutes.

Of the four Columbian Wyandotte hens not in laying condition, one consumed 5 gms. whole corn soaked in gentian violet water and voided first excrement in twenty-four hours, the second consumed 4 gms. and passed the first tinted excreta in 25 hours, the third ate 3 gms. and passed the first tinted excreta in twenty-six hours. From this it is evident that gentian violet causes constipation followed by a looseness of the bowels, indicating irritation to the mucosa of the bowels.

Of six Buff Plymouth Rock hens in laying condition, two consumed 30 gms. whole corn soaked in methylene blue water, and the first tinted excreta was voided in three hours and ten minutes. One consumed thirty-five gms. and voided tinted excreta in two hours and thirty minutes, the fourth consumed thirty-one grams corn meal and voided tinted excreta in three hours and thirty minutes, the fifth consumed 8 gms. and voided the first tinted excreta in one hour and thirty minutes, the sixth consumed 7 gms. and voided the first tinted excreta in twenty-three hours. The tendency here is for small amounts of methylene blue to cause constipation and larger doses irritation with specks of blood on the semi-liquid evacuations. There is only one exception to this tendency and that is in the case of the bird that consumed 8 gms. of corn and evacuated in one hour and thirty minutes.

SUMMARY

Digestive processes of the fowl are rapid. The greatest rapidity is shown in the laying and in the growing fowl, food passing on an average of three hours and fifty two minutes in the case of growing fowls and three hours and forty-six minutes in the cases of the laying hens. Next in activity comes the adult hen not in laying condition, averaging eight hours, and then the broody hen required an average of eleven hours and forty-four minutes.

It was noted that broody hens behaved the same in the experimental coops as on the nest, that is, the evacuations were fewer and the quantity evacuated each time increased over that of a normal hen.

We have not taken as accurate the fowls in which the gentian violet or methylene blue were given, as it exercised influence on the normal function of the intestinal tract.

In all these tests the hens were placed in the coops the day before the trial so that the crop was empty when the test feed was given.

EXPERIMENTAL FEEDING METHODS

The following method of feeding was used throughout our work. The coop as shown in Fig. 5 is made of four upright 2" x 2" pieces. The coop is eighteen inches square, the bottom of which is made of one inch mesh chicken netting and is two inches above the pan in which the coop is placed. The side of the coop is constructed of one inch chicken netting. The top is removable and is made of four 1" x 2" wooden strips nailed to two pieces of 1" x 2" at right angles. The dropping pan is constructed of block tin twenty inches square and one inch deep. It is reinforced at the rim with heavy copper wire.

The receptacle used for feeding consisted of a large, long-handled dipper in the bottom of which was soldered a 250 cc. tin cup. In the cup was placed the feed which was being used in the experiment. The hen stood in such a position when eating that if any of the feed was thrown outside the cup, it remained inside the large dipper and did not become wasted or mixed with the excreta. The correction was properly made in the feeding data.

The feeding experiments were conducted in a well-ventilated and well-lighted basement room. The feeding coops were placed on a specially constructed white top table and arranged in such a manner that if by any reason either feed or excreta were thrown out of the proper receptacles, it could at once be seen and proper corrections made.

In selecting our fowls we chose mature hens of lymphatic temperament. Such hens were brought from the Station and College poultry plant in the morning and placed in the feeding coops and allowed to remain till the next morning, being given only water. This allows the intestinal tract to become partially empty and conserves the appetite, thereby making the bird more fitted for the experiment.

A definite number of grams of the test feed was given at 7:30 a. m. and 4:30 p. m. The feed used in the experiment was always mixed with an equal number of grams of water and placed before the fowl in the feeding cup. It was soon observed that the bird would consume all the feed she cared to in twenty minutes.

The digestion experiment was divided into two periods, the first a four day preliminary period, the second a four day test period. Accurate records of feed consumed during these two periods were kept as shown by records of the appended tables. Excrement for analyses was saved only from the test period.

CARE OF EXCREMENT

Each morning preceding the feeding all excrement that remained on the wire bottom coop was carefully removed with a spatula and placed in the receiving pan. These pans were removed and replaced by clean pans.

The excrement was removed from the pan with a spatula and placed in a 500 cc. porcelain dish. The excrement that could not be removed with a spatula was washed off with alcohol and this washing was also placed in the porcelain dish. The excrement in the dish was then covered with 95% alcohol to prevent fermentation; to which 5 cc. of acetic acid was then added to convert the free ammonia into ammonium acetate. This was then dried as thoroughly as possible on a water bath. After drying on the water bath it was then placed in an electric oven and held at a temperature of 110 degrees C. for five hours. It was then removed and carefully weighed and placed in an air-tight container and properly labeled for analysis.

ANALYSES OF FEEDS

Moisture

Two samples of about three grains each of the substance is put into weighing bottles with ground glass covers. These are put into an electric oven and heated for five hours at 110 degrees C. After heating the bottles are allowed to cool, then weighed, heated again, and reweighed. This is continued until the weight is constant to 2 mg. From the loss of weight the percentage of dry matter is calculated and the percent of moisture is determined.

Ether Extract

A moisture-free sample is taken, representing about two or three grams of the substance. This is put into an extraction thimble. This thimble is placed inside of a soxhlet extraction siphon that is then connected to a Liebig condenser. This is then connected to a weighed extraction flask or bulb containing about 75 cc. of anhydrous ether. The extraction is continued for about two hours in an electric oven air bath.

The extracting flask or bulb is then put in a still and the excess of ether is recovered. The extraction flask is put into the electric oven and dried for one hour at 100 degrees C., removed from the oven and placed in a desiccator, cooled and weighed. This process of heating and weighing is continued until the minimum weight of fat is calculated.

Crude Fiber

The residue from the ether extract determination is put into a 500 cc. flask to which is added 200 cc. of boiling 1.25 percent of H_2SO_4 . This is connected to a condenser and boiled continuously for thirty minutes. This is filtered through a linen filter and washed with boiling water until the washings are no longer acid. The residue is then put back into the flask with 200 cc. of boiling 1.25 percent NaOH free as possible from sodium carbonate, and is boiled continuously for thirty minutes in the same manner as given for boiling with the acid. The alkaline solution is filtered at once and washed as rapidly as possible, and continued until the washings are neutral. The residue is dried at 110 degrees C. until it ceases to lose weight, weighed, incinerated completely, and weighed again. The loss of weight is considered to be the crude fiber.

Total Proteins

A sample of 0.7 grams of the substance is put into a Kjeldahl digestion flask, to which is added 10 gms. of powdered potassium sulphate, 0.7 gm. mercuric oxide, and 25 cc. H_2SO_4 . This mixture is then subjected to a slow heat for five minutes and a high heat for twenty minutes, or until digestion is complete. This is done under a hood. The liquid is then allowed to cool and to it is added 200 cc. of nitrogen-free water and a few pieces of copper wire. The flask is taken to the Kjeldahl distilling apparatus and 50 cc. of a saturated sodium hydroxid and 20 cc. of a potassium sulphate solution is added. The apparatus is then connected to the condenser. The content of the flask is mixed by shaking. One hundred fifty cc. are then distilled into a standard acid solution. The standard acid solution is then titrated and the percent nitrogen determined and this multiplied by 6.25 gives the amount of protein.

Ash

Two grams of the substance is weighed into a crucible, burned at a slow heat for twenty minutes, then fast heat until all of the carbon is burned, and a constant weight is maintained. Then the percent of ash is determined.

Nitrogen-Free-Extract

The nitrogen-free-extract is determined by difference.

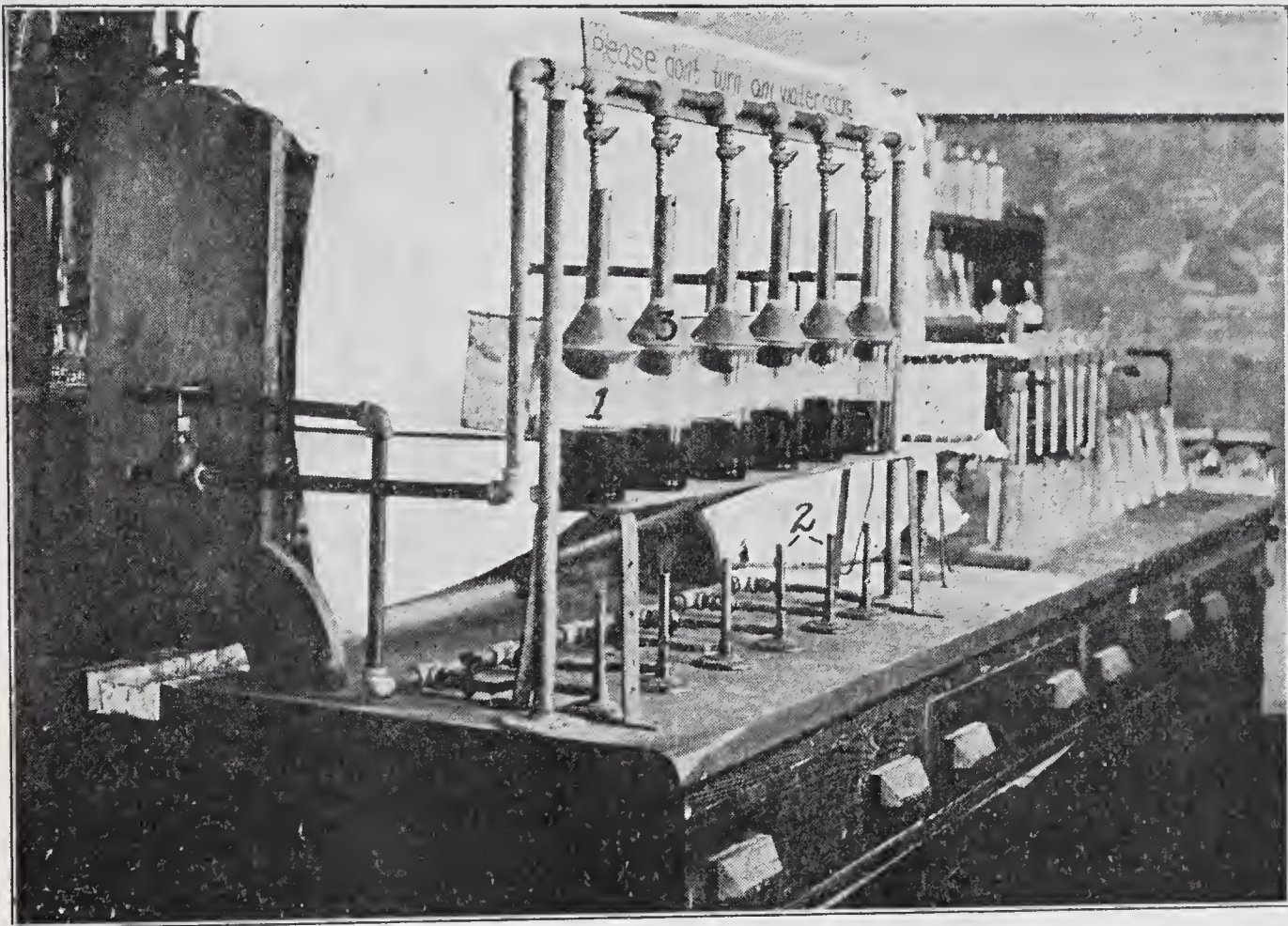


FIG. 1. CRUDE FIBER DETERMINATION APPARATUS

1. Beakers containing the feed sample.
2. The bunsen burners.
3. Copper water bulbs through which water circulates to prevent boiling over.

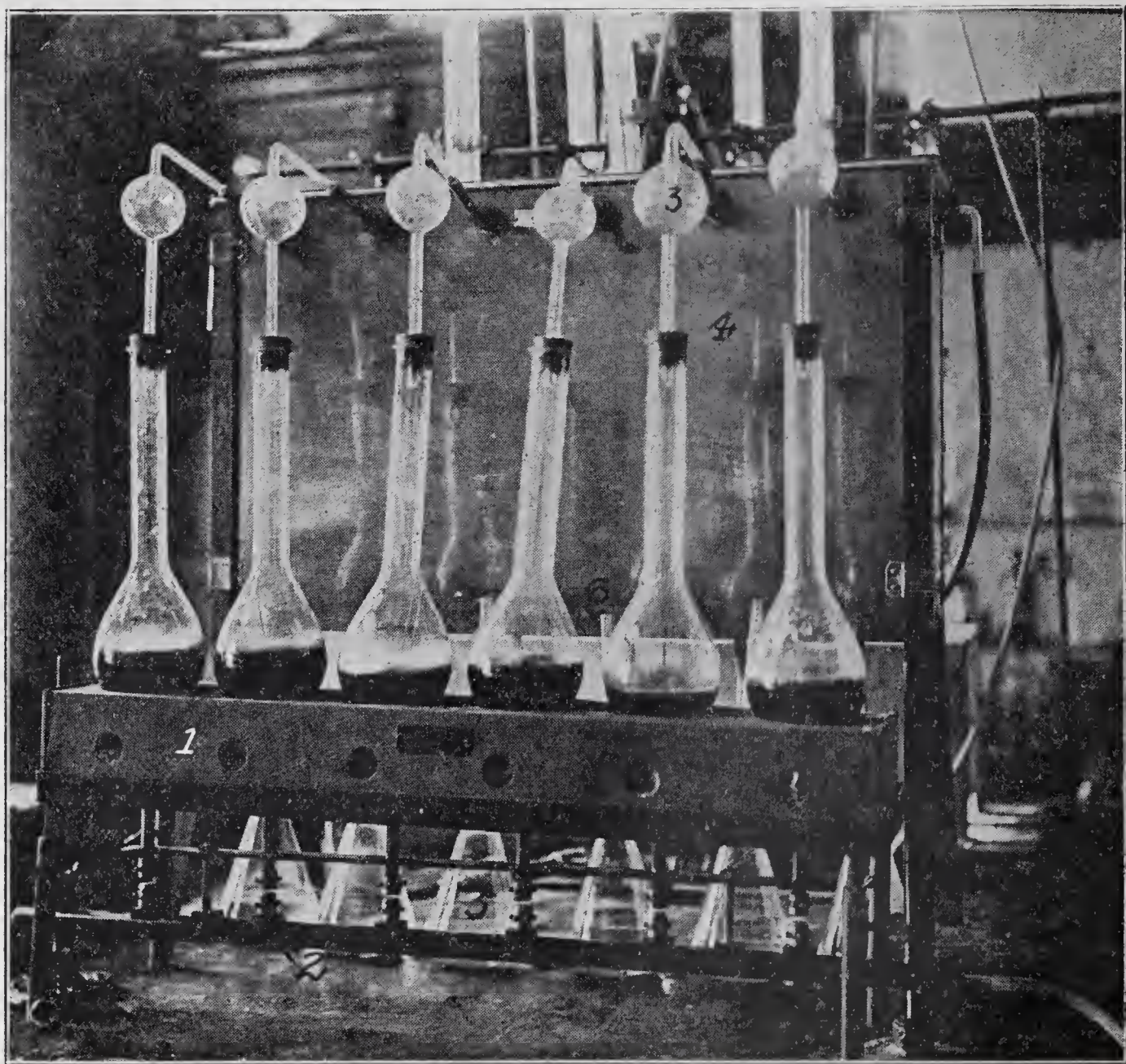


FIG. 2. KJELDAHL DISTILLING APPARATUS FOR THE DETERMINATION OF NITROGEN

1. Rack supporting Kjeldahl flasks.
2. Showing beneath it bunsen burners and gas connections.
3. Glass bulbs preventing direct overflow of boiling liquid in Kjeldahl flask.
4. Condenser with lead coils inside surrounded by running water. From the lead coils the condensed liquid flows into Erlingmeyer flasks 5, 6 expanded tube inserted in the stopper of the receiving Erlengmeyer flask containing glass beads moistened with water to prevent the escape of free nitrogen during the process of distillation.

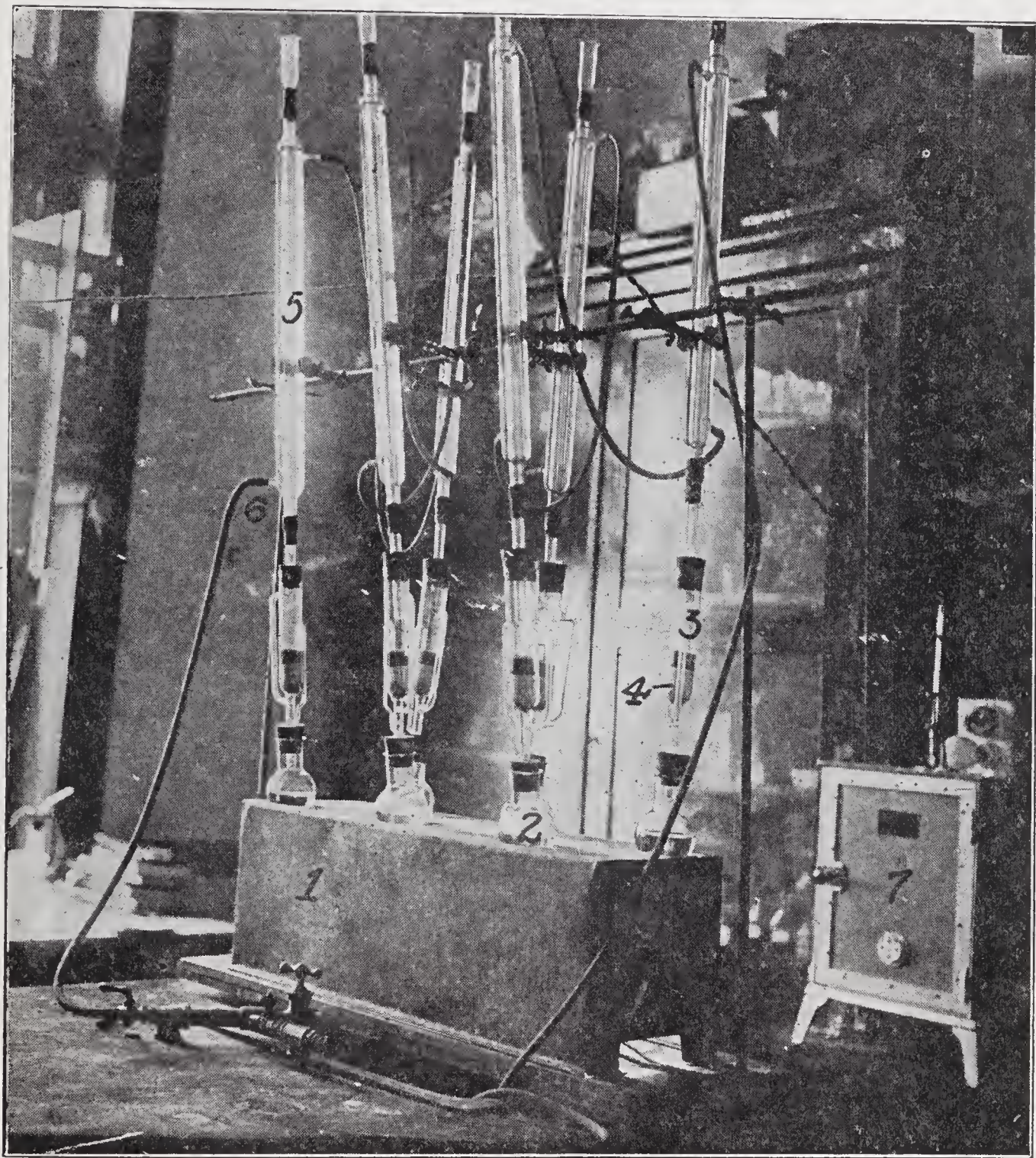


FIG. 3. APPARATUS FOR DETERMINING THE ETHER EXTRACT

1. Metal box having within six 120 watt nitrogen bulbs forming an electric air bath for distillation of ether.
2. Fat extraction flask receiving the extracted fat.
3. Soxhlet extraction tube containing extraction thimble.
4. Thimble containing the material from which to have the fat extracted.
5. Liebig's condenser showing rubber connections at 6 for inlet for cold water.
7. Electric oven for drying fat.

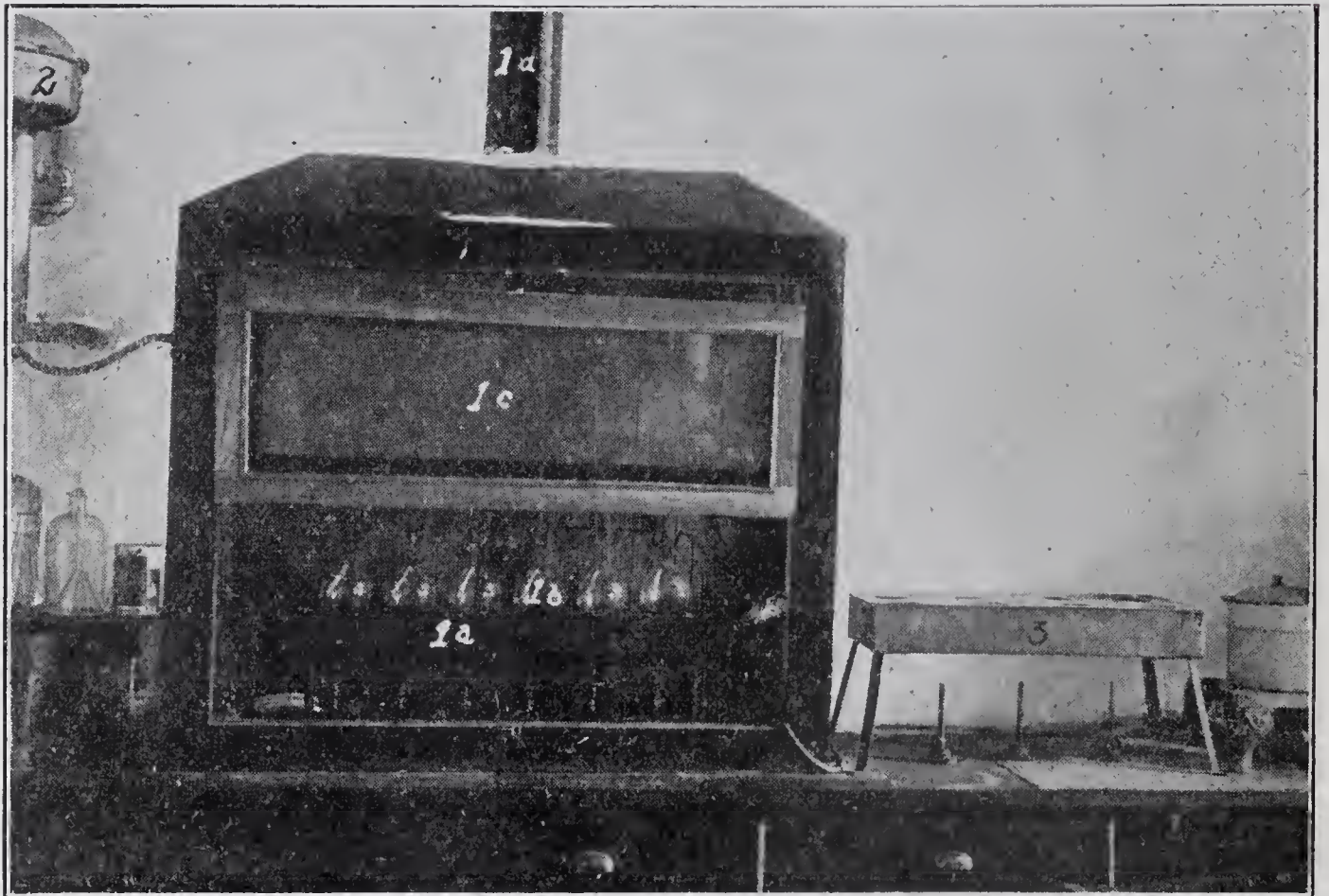


FIG. 4. PHOTOGRAPH OF A KJELDAHL DIGESTION SHELF USED IN THE EXPERIMENTAL WORK
1a. The shelf; 1b. The digestion flasks; 1c. The glass door to hood; 1d. flue to conduct the gas out of the hood.
2. The water still used to produce the distilled water.
3. The water or steam bath used in evaporation of excrements.

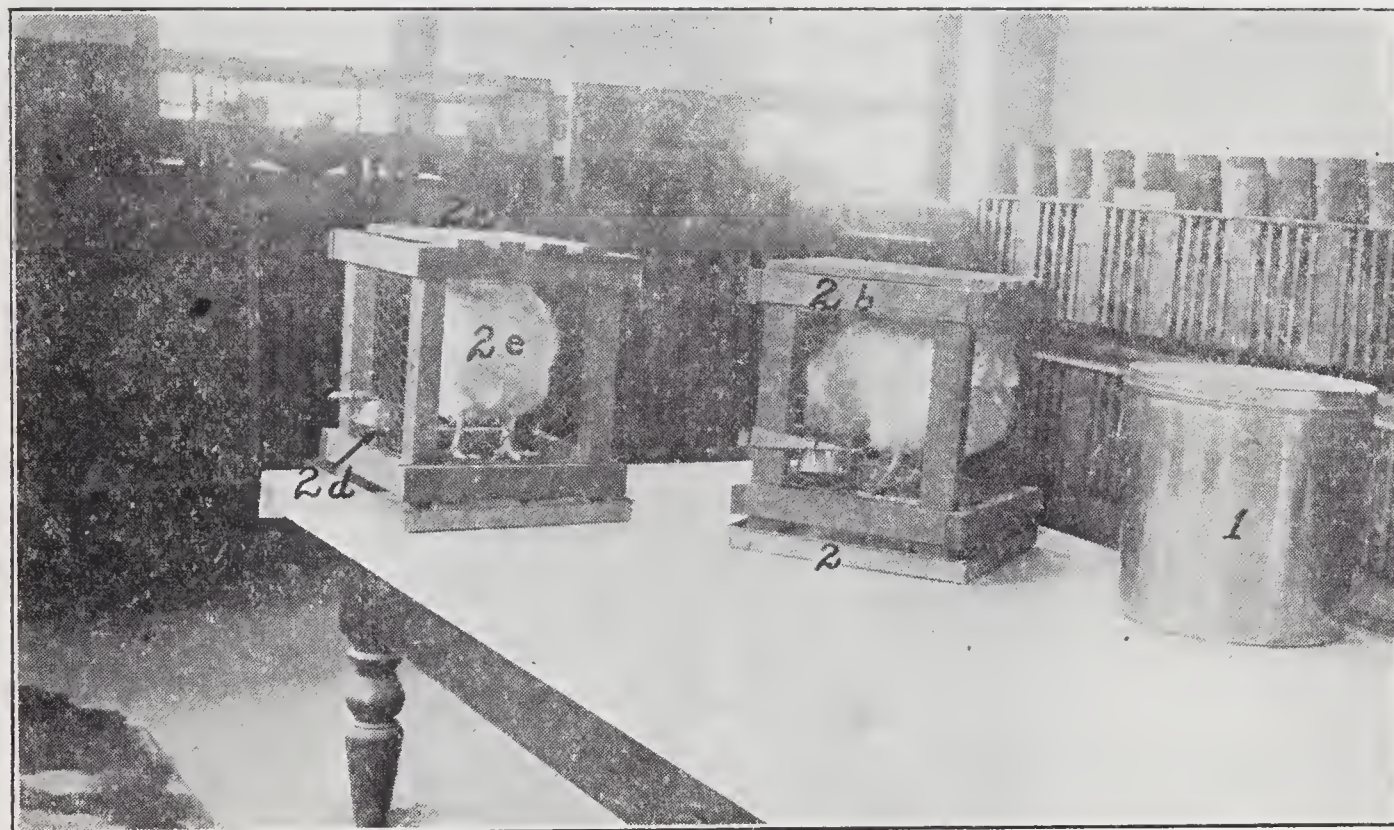


FIG. 5. PHOTOGRAPH SHOWING METHODS OF HANDLING BIRDS IN FEEDING TESTS

1. Feed container ; 2b. Feeding crate ; 2d. The feed cup.
2. Droppings pan ; 2c. Removable slatted top ; 2e. The experimental hen.

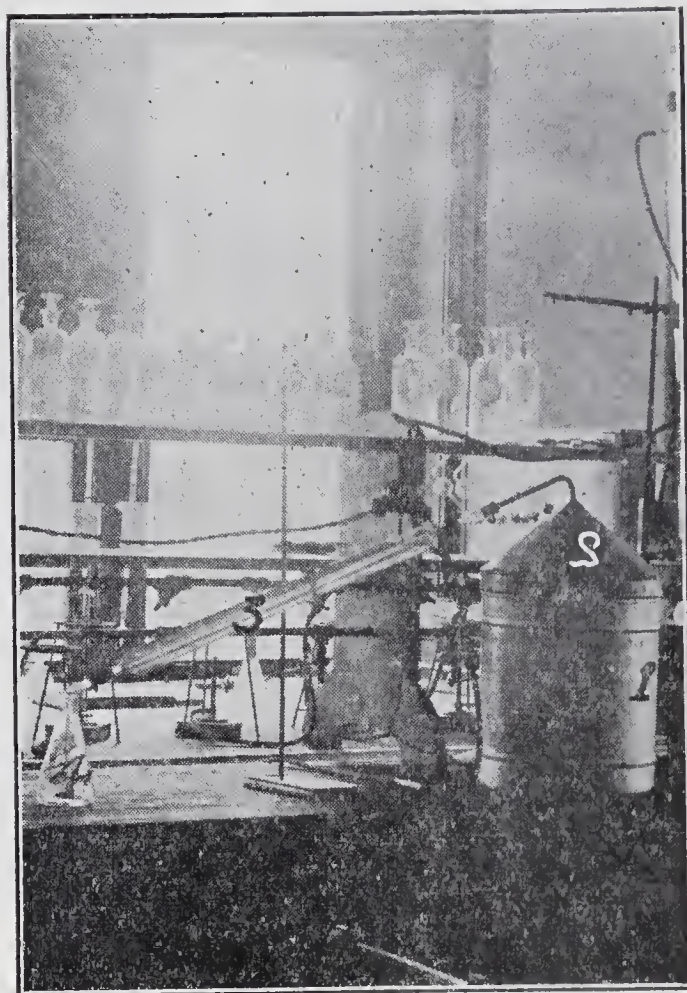


FIG. 7. APPARATUS FOR THE RECOVERY OF ETHER

1. Body of evaporator in which is placed a 120 watt nitrogen bulb.
2. Hood in which the fat bulbs containing fat and ether are placed.
3. Condenser.
4. Receiving flask.

GROSS AND CHEMICAL ANALYSES OF THE EXCRETA

The droppings were reduced to fineness by grinding or by beating in a large iron mortar with a large iron pestle. The material was then passed through a wire sieve with 256 meshes to the square inch.

In a gross study of this material there was observed grit consisting of quartz or silica, varying in size up to 2×4.5 m.m. and weighing 0.0813 gm.

Black bodies were also observed and under the hand lens they were recognized as pieces of cinders. One piece of glass was observed in one study. These birds had not been given grit for the entire period they were used. This includes the four preliminary days and the four test days in which the droppings were saved. Other bodies recognized included undigested feed. Chalk-like bodies, the largest of which measured $2 \times 3 \times 4$ mm. and weighed 0.0112 gm, consisted of urinary sediment and mostly of uric acid. In three tests the average weight of coarse parts was 0.0931. The percentage of foreign matter was 0.56.

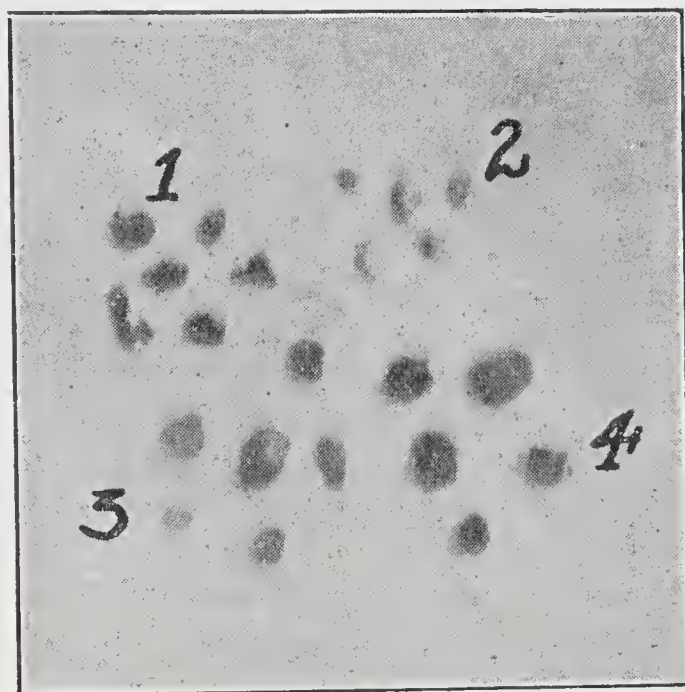


FIG. 8. A PHOTOGRAPH SHOWING THE FOREIGN AND OTHER HARD BODIES OF THE EXCRETA WHICH RESISTED GRINDING OR MACERATION AND WAS REMOVED BY AID OF THE SIEVE

1. Grit or quartz.
2. Pieces of cinders.
3. Masses of hard uric acid crystals.
4. Masses of undigested middlings.

Chemical Analyses of Excreta

The methods used in determining the moisture, ash, ether extract, crude fiber, nitrogen-free-extract, and total nitrogen are the same as those used in the feed analyses.

Determination of Free Ammonia

Place 0.7 gm. of the excrement in a Kjeldahl flask with 200 cc. of water and 5 gms. of magnesium oxide free of carbon dioxide. Then connect the flask with a condenser and distill 100 cc. of the liquid into standard acid, titrate and calculate the ammonia present.

Determination of Uric Acid

Take ten grams of thoroughly mixed ground feces, place in a 250 cc. beaker and treat with 100 cc. of 95% alcohol. Filter through paper and wash twice with 30 cc. of alcohol, then wash three times with ether and allow to dry. This removes the greater part of the coloring and fatty matter. The residue when dry is returned to the beaker. One hundred cc. of 5% solution of HCl is added and set in a refrigerator over night.

The following morning the material is filtered through paper and washed twice with cold water, returned to the beaker with 100 cc. of water and enough piperidine added to dissolve the uric acid. A few drops of phenolphthalein were added to the solution in order to determine the amount of alkali necessary to dissolve all the uric acid, also the disappearance of the white particles from the bottom of the beaker indicates complete solution. It usually requires from one-half to three-fourths of an hour heating on the water bath with frequent stirring to effect complete solution. After the white particles all disappear and the solution remains alkaline it is passed through a coarse linen filter into a five hundred cc. graduated flask, washed thoroughly with hot water, squeezing out, filtered two or three times to facilitate washing, cooled and made up to the mark and thoroughly mixed. The solution is then allowed to settle until the fine particles which passed through the cloth settle out, leaving a clear solution which can be drawn off. The solution is allowed to settle over night so that it will be clear in the morning.

Fifty cc. portions, representing 2 gms. of the feces, are taken, made acid with HCl, evaporated on a water bath to 25 cc. and set in a refrigerator over night, or better still for twenty-four hours. Then filter through a 597 S. & S. filter paper on a Buckner's funnel 50 mm. in diameter, under pressure, wash three times with cold water, then with absolute alcohol, and lastly two or three times with ether to remove any trace of remaining fat. The uric acid is thus collected on a very small filter paper which is transferred to a beaker, boiled with 35 cc. of distilled water and titrated with N—10 piperidine solution. It is very necessary to complete the end reaction with the solution as near the boiling point as possible, or concordant results cannot be attained. All determinations are run in triplicates. The first titration is made roughly to find out the approximate end point. In titration, as the end point is being reached, the beaker is again put over the flame and brought to boiling point, then titrated to completion.

To test the accuracy of the method pure uric acid is added to feces that contain none. The average determination in our case gave 98.2 percent of acid recovered.

The piperidine solution is standardized with uric acid which is purified by twice recrystallizing and found practically pure.

THE PREPARATION OF PIPERIDINE FROM PYRIDINE AND SODIUM

Action of metallic sodium in solution of pyridine in absolute alcohol.

Absolute alcohol was made from 95% alcohol by dehydrating it with calcium oxide and redistillation at 80 degrees to 90 degrees C.

One hundred cc. pyridine was dissolved in 1800 cc. of absolute alcohol and 156 gms. of metallic sodium gradually added till all was dissolved. Sodium ethylate was removed by filtration three times during the adding of the sodium.

Excess alcohol was distilled. Portion of distillate caught at 80 degrees to 82 degrees C. and was saved for further use.

The portion of the distillate caught at 105 degrees to 110 degrees C. was saved as piperidine.

The distillate caught between 105 degrees to 110 degrees C. was very strongly alkaline to phenolphthalein and caused uric acid to dissolve, decolorizing the phenolphthalein color.

DISCUSSION

The constituents of mammalian urine are classed as organic and inorganic. The chief organic constituents are nitrogenous end products—urea, uric acid, hippuric acid, creatin, and creatinin; aromatic compounds—benzoic acid, etherial sulphates of phenol, cresol, and small amounts of amino acids, allantoin, purin bases and coloring matter and mucous⁸; salts consisting of sulphates, phosphates and chlorides of sodium potassium, calcium, and magnesium.

The total nitrogen of the urine consists of urea nitrogen, uric acid nitrogen, ammonia nitrogen and creatinin nitrogen.

Creatinin is hydrolized creatin. It has been generally considered that creatinin of the urine arises from the creatin of the muscles. In alkaline urine creatin appears in greater quantity while the reverse is the case with strongly acid urine.⁹

Urea originates in the body partly from retrograde tissue metamorphosis, including the blood, and partly from splitting up of unassimilated nitrogenous principles of the food.

Uric acid in birds is formed in the liver from ammonia compounds and lactic acid. It is formed from the splitting of nucleoproteins¹⁰. These nuclein bodies are compounds of protein with nucleic acid, the latter constituent splitting up into thymic acid and derivatives of purin among which is uric acid, xanthin, hypoxanthin, etc.

The ammonia salts present in urine are an index to the neutralization of acids in the body. The acid substances are produced as the result of metabolism. When they are in excess there is an increase in the ammonia of the urine, the formation of ammonia in the muscles being the natural protection of the body against acid poisoning.

Hippuric acid is a product of herbivora.

Xanthin is contained in human urine.

Brown says that the nitrogenous substances of birds' urine, aside from ammonia urate, are present in exceedingly small quantities. In fact it must be borne in mind that the creatinin, hippuric acid, purin bases, etc., are present in mammalian urine in relatively minute quantities, and this is conspicuously brought out when the amount of such extractives are calculated per kilo weight. Hence the urine of animals of so low a body weight as poultry would contain in all probabilities but minimal amounts of such exactives if present at all. In view of these considerations very large quantities of excrement would be required to demonstrate the presence of such bodies.

Meissner, in 1861, found in hens fed on meat the urine yielded creatin but no creatinin. Only minute amounts were eliminated by the grain-fed birds, and in many cases its presence could not be satisfactorily demonstrated. Liver-fed hens produced less than those fed on meat. When creatin was given hypodermically it was practically all recovered as such in the excrement. He claims that two to four percent of the urinary nitrogen is urea. He did not find hippuric acid in the urine of hens.

Milroy says that urine of hens may contain in very small quantities purin bases.

⁸ Smith, Col. F., Veterinary Physiology, p. 292.

⁹ Purdy, Practical Urine Analysis, p 36.

¹⁰ Webster, Diagnostic Methods, p 218.

Owing to the smallness and shortness of the large intestine and the rapidity of the digestive processes of the hen and the quick passing out of the fecal matter, there would be expected to be a relatively small amount of putrefaction and hence small amounts of indol, skatol, and bodies of that type.

Cristiani detected etenol sulphuric acid in a hen's urine after a meat diet and found that the injection of indol leads to the excretion in the form of indoxylsulphuric acid.

**THE ASH INTAKE AND ASH OUTGO AND ITS EFFECT UPON THE
QUESTION OF COEFFICIENTS OF FEEDING
STUFFS WITH POULTRY**

During the time when the first series of digestion coefficients were being summarized it was observed that a rather large percentage of ash was found in the excrement. As shown in an earlier part of this paper grit is continually being voided.

An unsuccessful effort was made to separate the grit from the excreta, both sieve and forces methods being used. It was decided to then carry on a series of experiments extending over a period of twelve months to determine the fate of grit in the body of the fowl.

The analytical method consisted of the following proceedings:

Six hens were brought off range from the poultry plant of the Station and placed in the feeding coops used for the digestion coefficient feeding experiments. The hens were numbered one to six, inclusive.

The following mash and grain rations were fed:

MASH	
Wheat middlings-----	60 pounds
Ground oats-----	10 pounds
Corn meal -----	15 pounds
Meat scrap-----	15 pounds
GRAIN	
Corn -----	50 pounds
Oats-----	50 pounds

The mash had an ash content of 4.1 percent. The grain mixture had an ash content of 2.1 percent. On the thirteenth day of this experiment a new batch of mash was secured having the same feeds, but having an ash content of 4.7 percent.

The hens were fed mash in the morning and grain in the afternoon. The excreta was collected every twenty-four hours, dried at a temperature of 106 degrees C. in an electric oven and weighed. The excreta was then finely pulverized in an iron mortar. From this finely pulverized excrement 0.5 gm. sample was taken and an ash determination made according to the Official Method of Analysis, Bulletin No. 107, revised, Bureau of Chemistry, U. S. Department of Agriculture. The ash determinations were always made in duplicate and were required to check within 0.3 of one percent.

There will be given here only the final summary table showing the percent feed digested during the normal four day digestion period and the percent digested when the excess ash is taken into consideration with hens 1, 3, 5, and 6. The difference being the final correction factor to be applied to the digestion coefficients tables for poultry.

TABLE I
SUMMARY TABLE SHOWING ASH INTAKE AND ASH OUTGO OF FIVE HENS

Days	Total Amount Feed	Total Amount Excrement*	Percent Digested	Total Amount Excess Ash	Percent Digested	Difference in Percent
5th	226	85.9	61.97	4.35	64.06	2.09
6th	230	102.0	55.23	6.86	58.31	3.08
7th	248	105.8	56.34	6.71	59.28	2.94
8th	256	99.5	60.95	6.07	63.39	2.44
Total and averages	960	393.2	58.62	24.17	61.26	2.64**

*In grains.
**Final correction factor.

From this table it is seen that the correction factor under the conditions under which these experiments were run is 2.64 percent. That is the average ash thrown off in the form of grit between the fourth and eighth days amounted to 2.64 percent.

Graph 3 from hen 3 is given as it is an average result and will illustrate the curve of ash intake and outgo from the first day off of grit to the one hundredth day and then what happens when grit is then given and then to the 114th day.

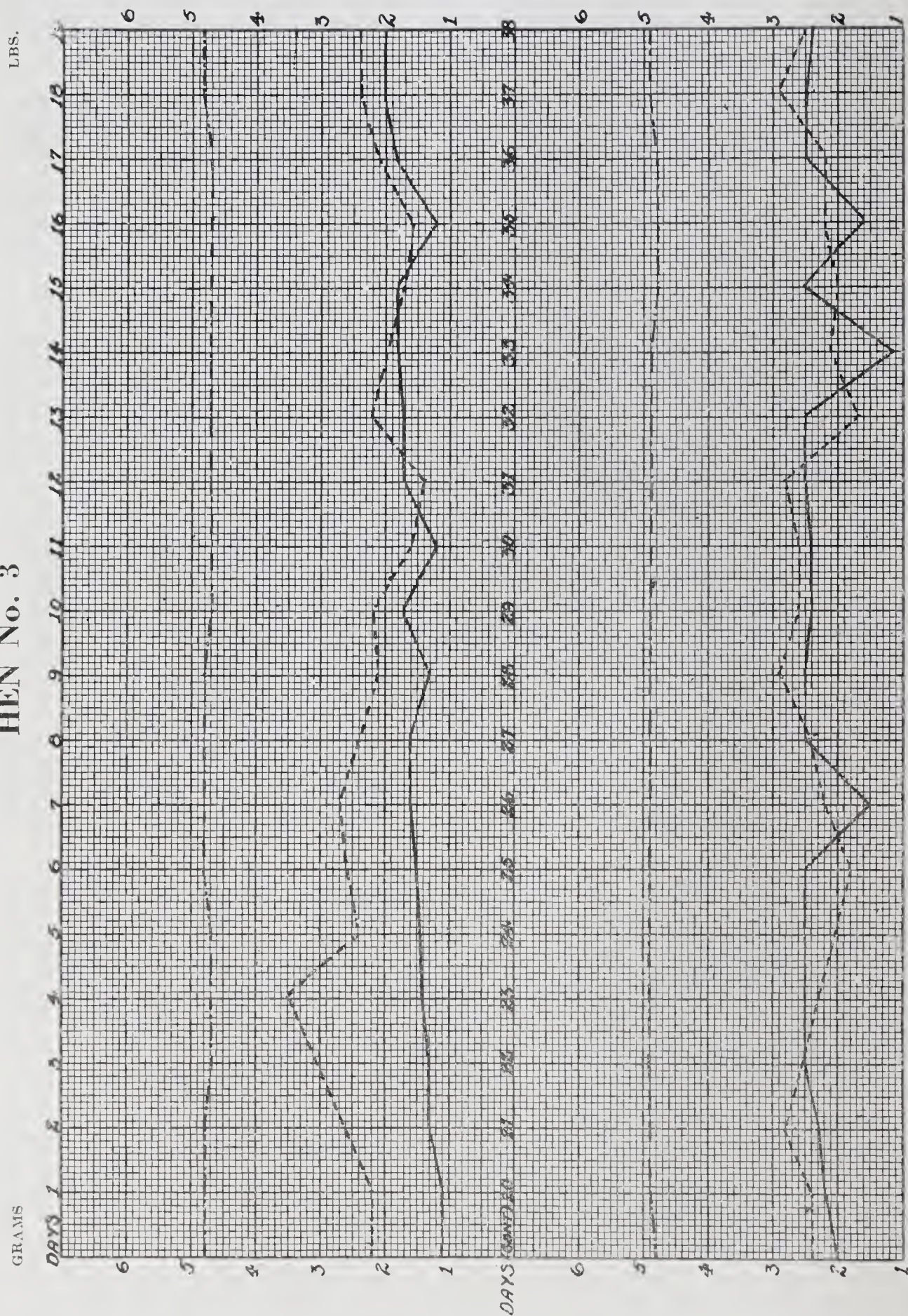
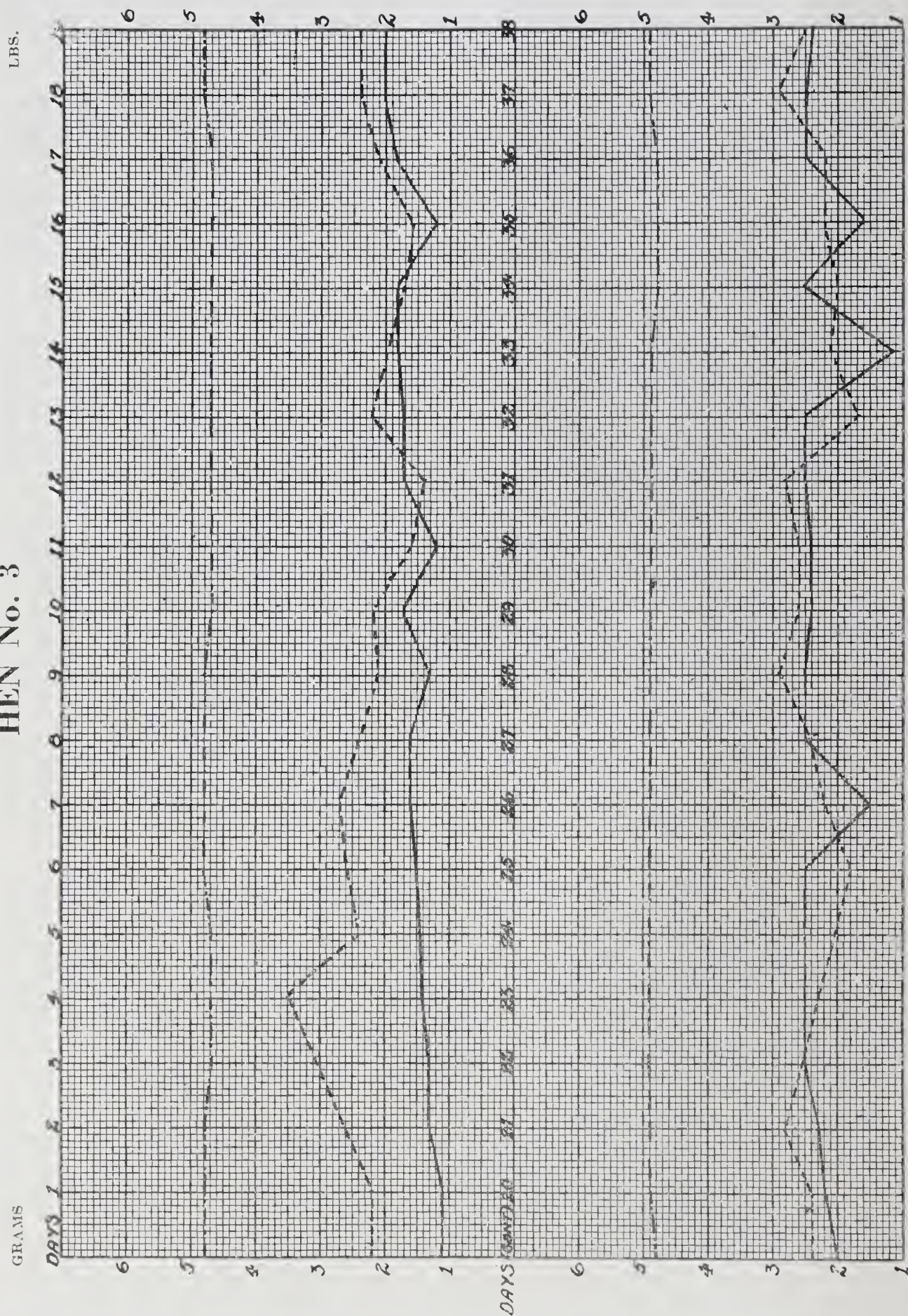
Hen No. 3 represented in the graph consumed 1.1 grams of ash in the feed the first day and gave off 2.2 grams of ash. The ash outgo increased until the fourth day, when it reached 3.5 gm. From the fourth to the twelfth day it consistently decreased until on the twelfth day the ash outgo was three-tenths of a gram less than the ash intake. From the twelfth to the one-hundred-second day the intake and outgo lines are constantly crossing and recrossing each other. On the one hundredth day a cup of grit was placed before the bird. There was an increase in ash outgo from the one hundred and first to the one hundred and third day, there was then a slight drop till the one hundred and sixth day and a continuous increase from the one hundred and sixth to the one hundred and fourteenth day when the experiment was discontinued.

A summary study of all the tests show that the ash outgo for the first twelve days is always greater than the ash intake, thus indicating that the residual amount of ash is reached on or about the twelfth day. The graphs also show that as long as the bird is deprived of grit that the intake and outgo lines continuously cross each other, but upon giving the bird free access to grit on the second day there is a considerable increase in the ash outgo over that of the intake in the feed.

This indicates that when the bird has free access to grit on range that she is continuously taking in new and fresh grit.

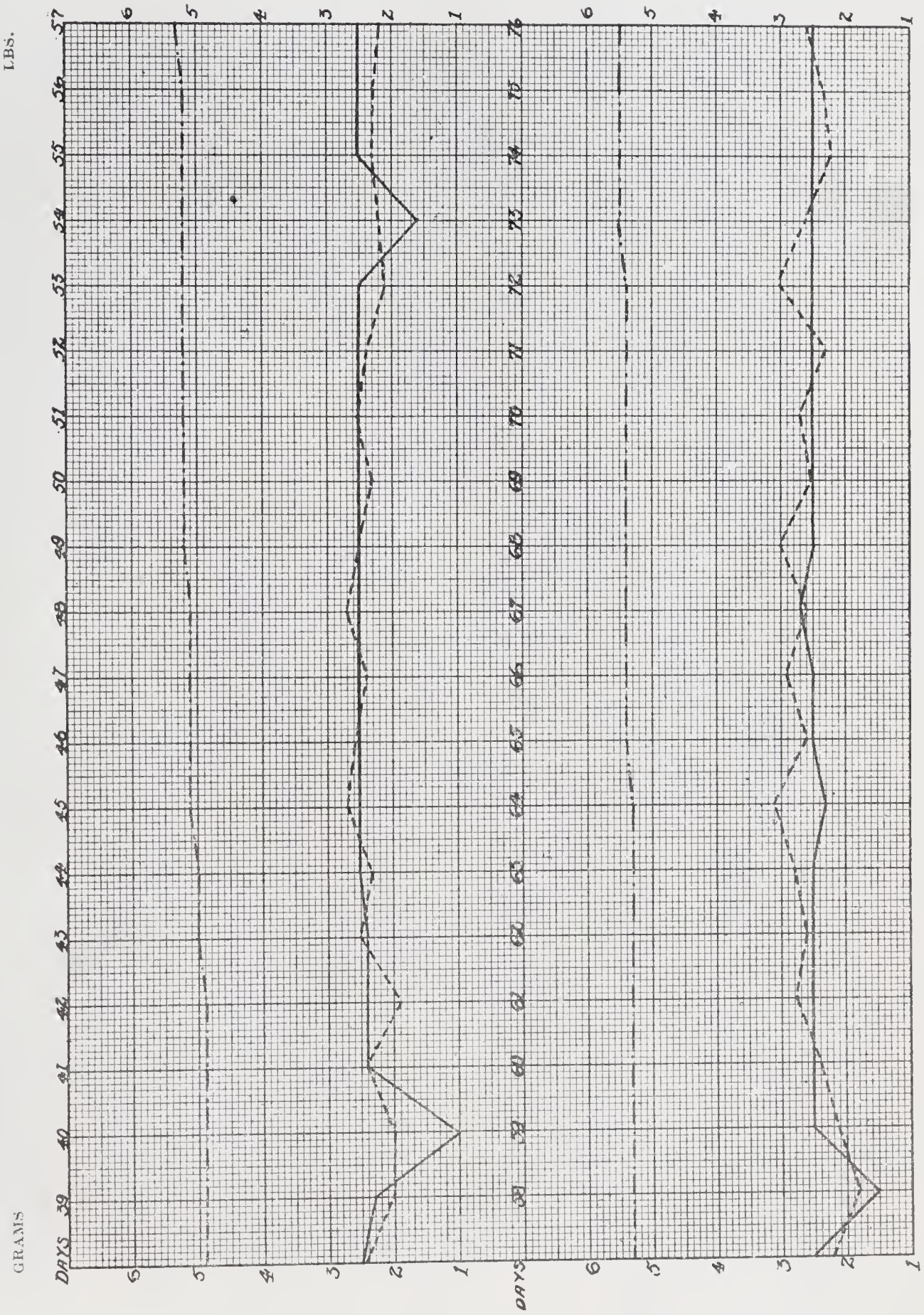
Thus in Table I is given a final summary of the amount of feed consumed during each day of the normal four day digestion period, total amount of excrement voided and the percent of feed digested. The total amount of excess ash voided each day, the percent digested when the excess ash is taken into consideration and the difference is the correction factor. During the four day normal digestion period the five hens consumed 960 gms. feed. They gave off 393.2 gms. excrement, showing 58.62 percent digested. They gave off 24.17 gms. more ash than they took in in the feed. When the excess ash was deducted from the excrement and the percent feed digested it shows that 61.26 percent is digested. A difference of 2.64 percent. This is the final correction factor to be applied to the digestive coefficient tables.

HEN No. 3

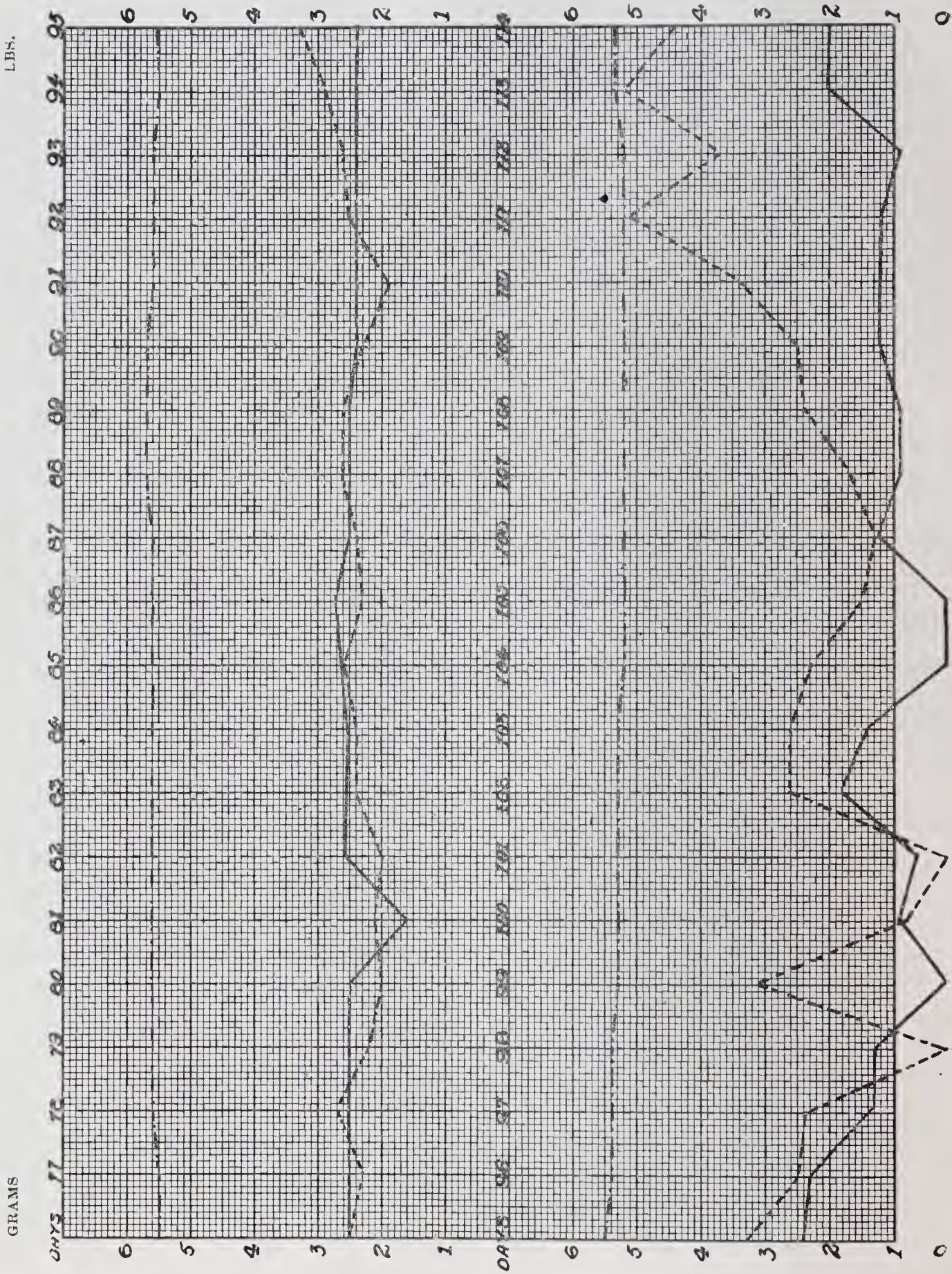
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HEN No. 3

(CONTINUED)



HEN No. 3
(CONTINUED)



THE FATE OF GRIT IN THE FOWL

Since the fowl has no teeth with which to grind its feed it is common knowledge that the muscular walls of the gizzard contracting upon its contents, namely, food and grit, reduces the food to fineness. The problem is to make an effort to determine how long such grit is useful in the gizzard and how often it must be replenished. Does a hen constantly consume more than she really requires, and if so, is there a tendency to a residual amount constantly kept in the gizzard?

Fowls of the American breeds were used in the experiment. Only hens were tested and birds two to three years old were used in the test. The hens could not be expected to lay under the conditions in which they were required to be kept.

Thirty-six hens, all Barred Plymouth Rocks, were kept in coops eighteen inches square. The coops were provided with one inch mesh wire netting bottoms so that the excreta would immediately pass through to a second floor as soon as voided. This prevented a possible reconsumption of any grit passed in the excreta. Hens were killed at different times and the gizzard content examined for the grit which still remained.

Analyses of the intake and outgo of the feed, and the weight of the birds, were taken as an indication as to whether the grit content of the gizzard was sufficient for normal physiological process of that organ.

The feed for 365 days, the duration of the test, consisted of regular scratch feed and dry mash used on the College and Station poultry plant.

Since the detail tables are quite voluminous it is thought best to give only the summary table and to show the entire series of tubes showing the amount of grit left in the gizzard at the end of the various periods. The following tabulation will serve the purpose of a comparative study of the amount of grit.

TABLE II
THE AMOUNT OF GRIT REMAINING IN THE GIZZARDS OF HENS AT THE END OF EACH PERIOD

Number Days Without Grit	Weight of Hens at Start (lbs.)	Weight of Hen When Killed	Weight of Grit in Grams	Remarks
14	5.2	5.4	9.5012	Killed
14	6.4	6.3	13.1136	Killed
21	4.5	4.8	8.3126	Killed
21	5.3	5.8	16.9326	Killed
28	4.6	4.9	11.8763	Killed
28	7.0	7.3	22.6531	Killed
36	4.8	5.7	16.4389	Killed
36	2.7	4.0	5.0378	Killed
42	7.0	4.2	8.4531	Died of Sarcema
93	3.6	3.2	11.6341	Killed
120	3.8	6.2	4.9643	Killed
124	5.8	6.1	5.6321	Killed
143	5.6	4.9	4.7532	Died of Mites
144	7.0	5.8	9.5923	Killed
150	5.7	5.7	6.5120	Died of Mites
153	7.1	5.6	4.5644	Died of Mites
154	6.5	5.5	5.9633	Killed
156	6.8	5.8	14.0326	Died of Mites
170	2	2	9.8670*	Died
248	6.2	6.1	2.5200	Killed
270	6.3	6.6	5.0000	Killed
300	5.7	5.9	3.9525	Killed
330	5.1	6.1	1.9530	Killed
365	6.2	5.2	2.5610	Killed
375	6.7	7.1	5.8915	Killed

*This cockerel was sent to the laboratory when about two pounds in weight. It remained in the coop till it died on the 170th day after coming to the hospital. It was affected with partial paralysis from which it never entirely recovered.

DISCUSSION

The feed records show that the appetite kept up fairly well for birds not having exercise. This is of interest in view of the fact that it is a check on the hens which were used in the digestive coefficient work where with single feeds the birds soon went off feed. In these cases the fowls received a variety of feed.

From these preliminary tests it is seen that a bird may go 365 days without being fed grit, and have plenty of grit remaining in its gizzard with which to grind its feed. The grit that had remained in the gizzard 365 days appeared just as sharp as that found in the gizzard at the commencement of the tests. In fact we do not believe that the grinding process in the gizzard of the fowl is one of sharp cutting processes, but rather the following process. The food soaks more or less in the crop depending on the length of time it remains there. The food passes from the crop through the second portion of the esophagus to the proventriculus where it soaks in a strong acid secretion. From the proventriculus the food passes into the gizzard where the muscles of the walls of the gizzard contract, squeezing the soaked grain among the grit and by a squeezing rotary motion the food is reduced to fineness and is more like the action of a ball mill. Birds hold their weight and remain perfectly healthy on either sharp or dull grit.

There is a tendency for a fowl to eat more grit than is essential for grinding the food. In another series of experiments we have shown that the amount of mineral given off for the first twelve days was much more than that taken in. Further experiments showed that this was due to the grit passed off from the gizzard. While there is a tendency to pass off the excess grit and to keep a residual amount, yet the amount retained varies greatly with different individuals.

One hen at the end of 365 days had 5.89 grams of grit, as much as one of the hens that was killed for examination on the thirty-sixth day. One hen that died on the one hundred and fifty-sixth day had 14.03 gms., or more than that contained by the gizzards of the hens killed on the fourteenth day and twenty-first day. As shown by the health of the birds, a fowl may go longer than a year without replenishing her grit.

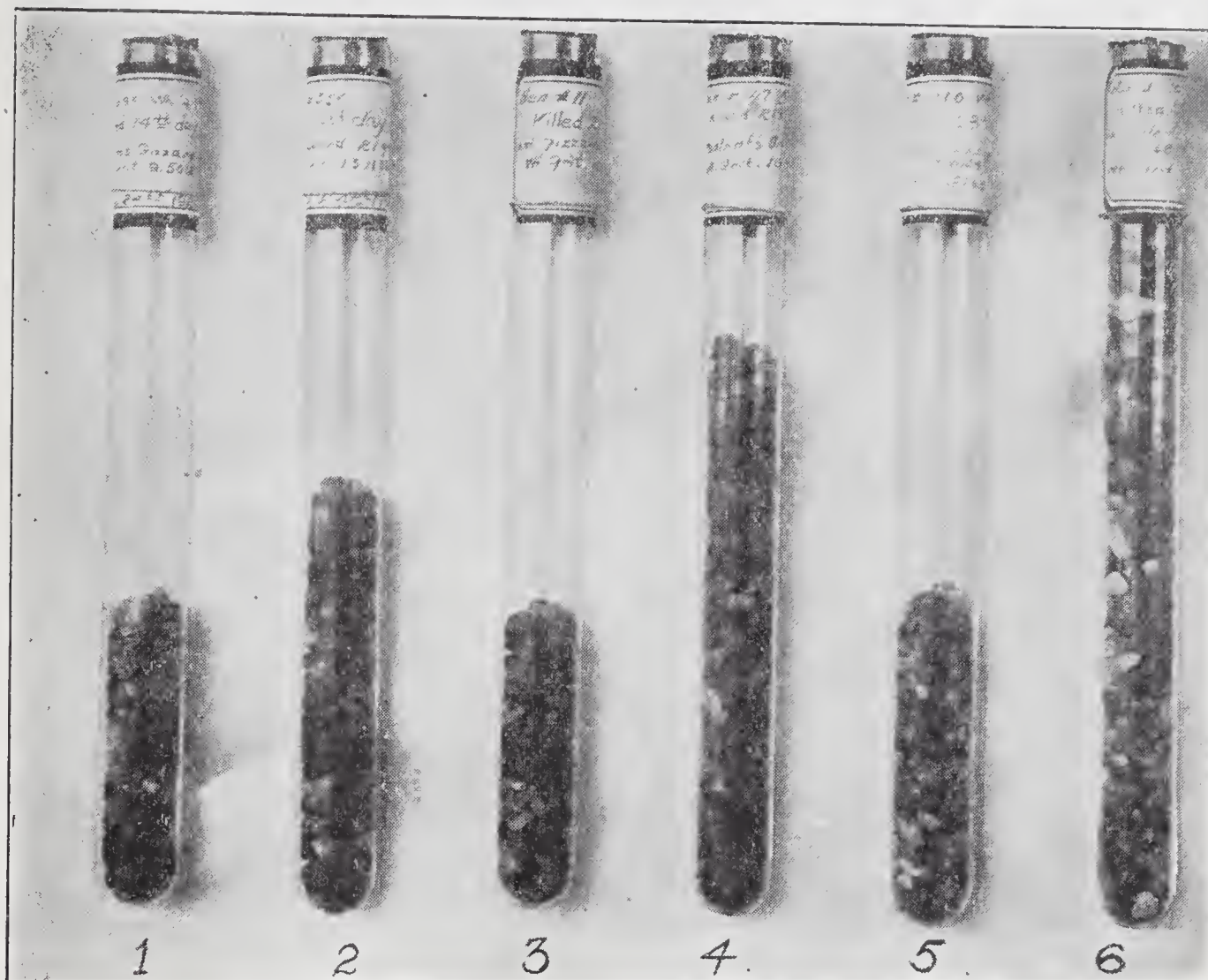


FIG. 9. AMOUNT OF GRIT REMAINING IN THE GIZZARDS OF HENS AT THE END OF EACH PERIOD.

Hen No. 1, killed 14th day.	Wt. gizzard, 13.00 gms.	Wt. grit, 9.50 gms.
Hen No. 2, killed 14th day.	Wt. gizzard, 21.00 gms.	Wt. grit, 13.11 gms.
Hen No. 3, killed 21st day.	Wt. gizzard, 12.01 gms.	Wt. grit, 8.31 gms.
Hen No. 4, killed 21st day.	Wt. gizzard, 19.03 gms.	Wt. grit, 16.93 gms.
Hen No. 5, killed 28th day.	Wt. gizzard, 13.46 gms.	Wt. grit, 11.87 gms.
Hen No. 6, killed 28th day.	Wt. gizzard, 28.19 gms.	Wt. grit, 22.65 gms.

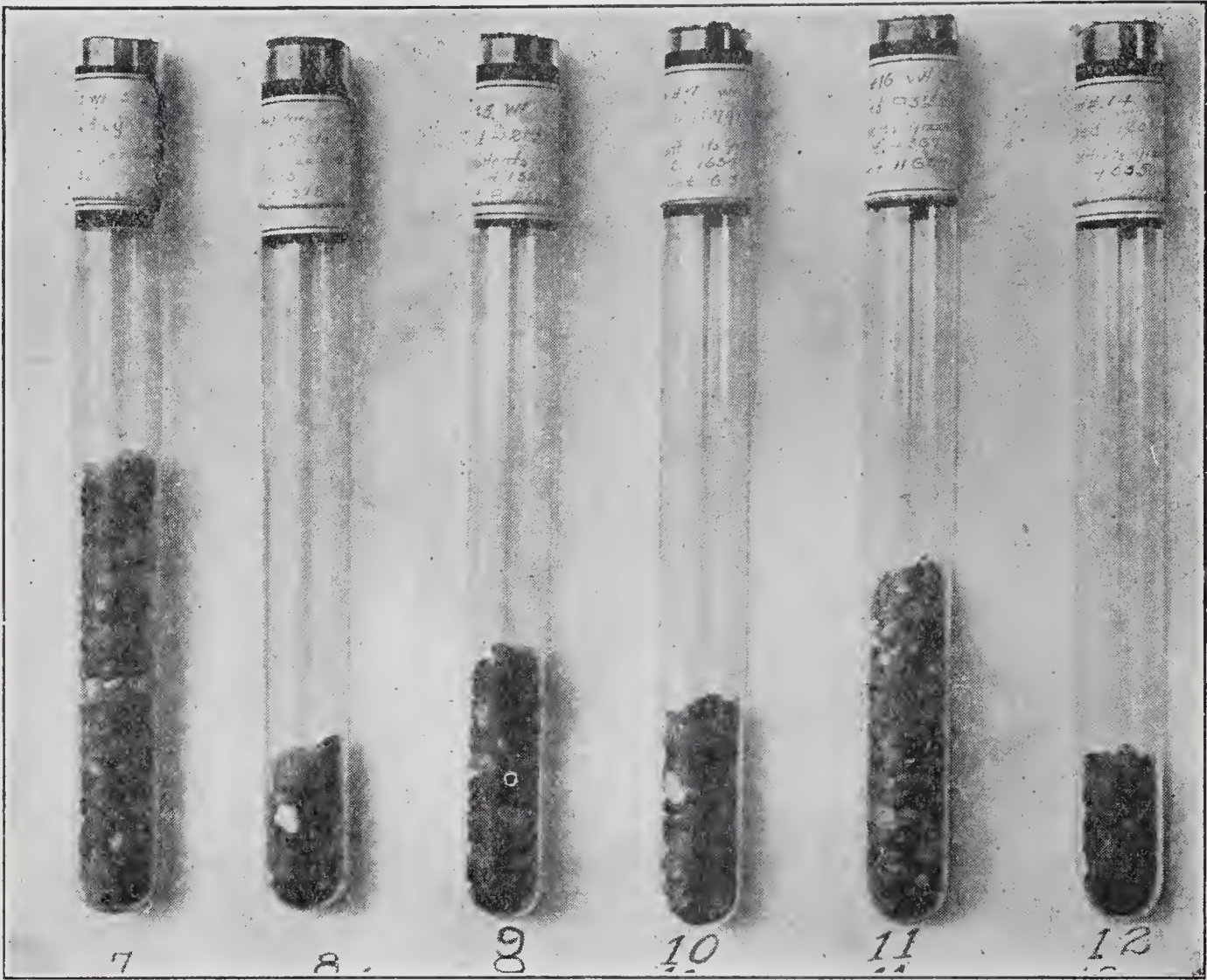


FIG. 10. AMOUNT OF GRIT REMAINING IN THE GIZZARDS OF HENS AT THE END OF EACH PERIOD.

Hen No. 7, killed 36th day.	Wt. gizzard, 19.00 gms.	Wt. grit, 16.43 gms.
Hen No. 8, killed 36th day.	Wt. gizzard, 7.10 gms.	Wt. grit, 5.03 gms.
Hen No. 9, killed 42d day.	Wt. gizzard, 14.13 gms.	Wt. grit, 8.46 gms.
Hen No. 10, killed 79th day.	Wt. gizzard, 20.76 gms.	Wt. grit, 6.37 gms.
Hen No. 11, killed 93d day.	Wt. gizzard, 15.43 gms.	Wt. grit, 11.63 gms.
Hen No. 12, killed 120th day.	Wt. gizzard, 9.63 gms.	Wt. grit, 4.96 gms.

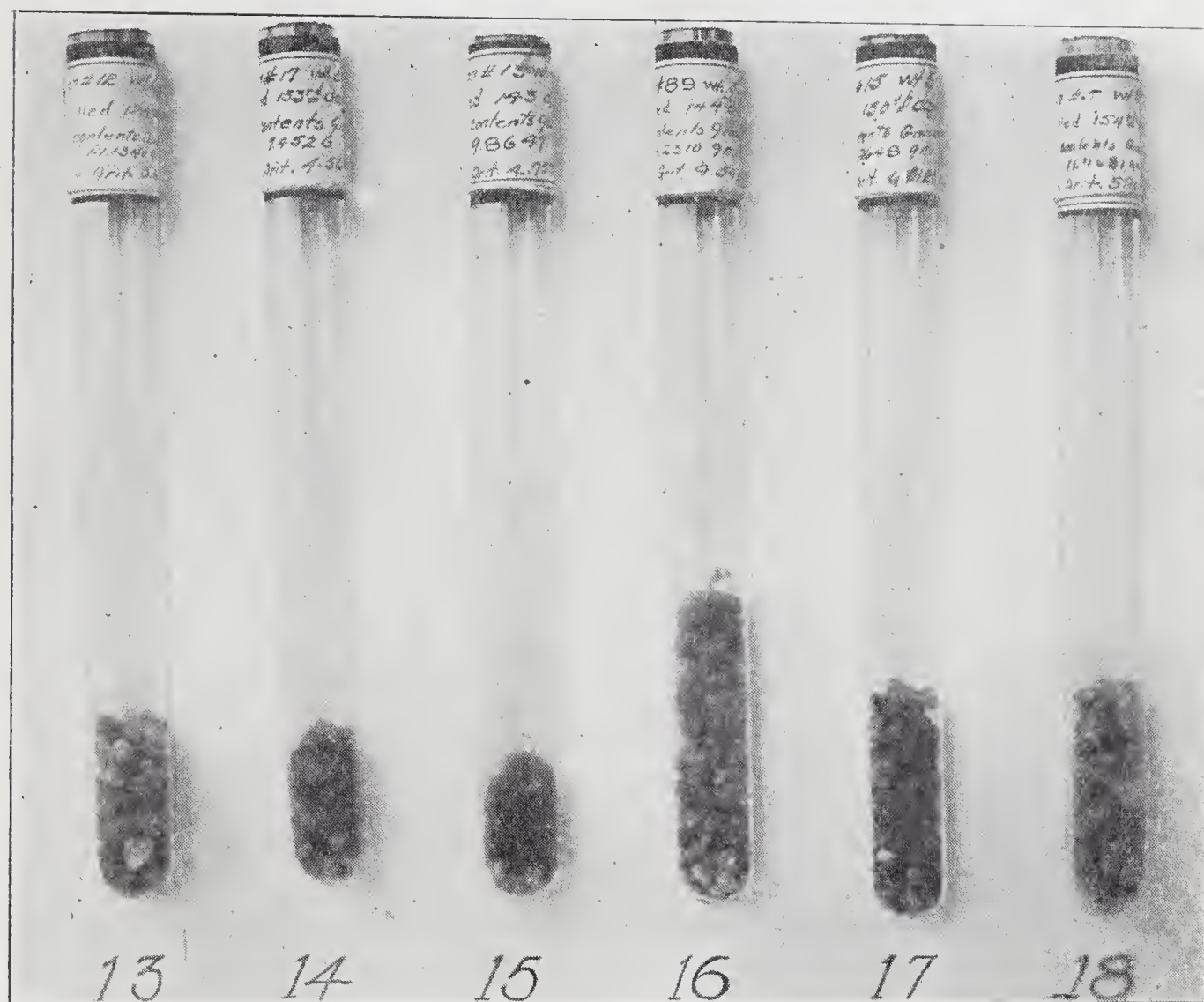


FIG. 11. AMOUNT OF GRIT REMAINING IN THE GIZZARDS OF HENS AT THE END OF EACH PERIOD.

Hen No. 13, killed 124th day.	Wt. gizzard, 14.13 gms.	Wt. grit, 5.63 gms.
Hen No. 14, killed 143d day.	Wt. gizzard, 9.86 gms.	Wt. grit, 4.75 gms.
Hen No. 15, killed 143d day.	Wt. gizzard, 9.86 gms.	Wt. grit, 4.75 gms.
Hen No. 16, killed 144th day.	Wt. gizzard, 13.23 gms.	Wt. grit, 9.59 gms.
Hen No. 17, killed 150th day.	Wt. gizzard, 11.96 gms.	Wt. grit, 6.51 gms.
Hen No. 18, killed 154th day.	Wt. gizzard, 11.76 gms.	Wt. grit, 5.96 gms.

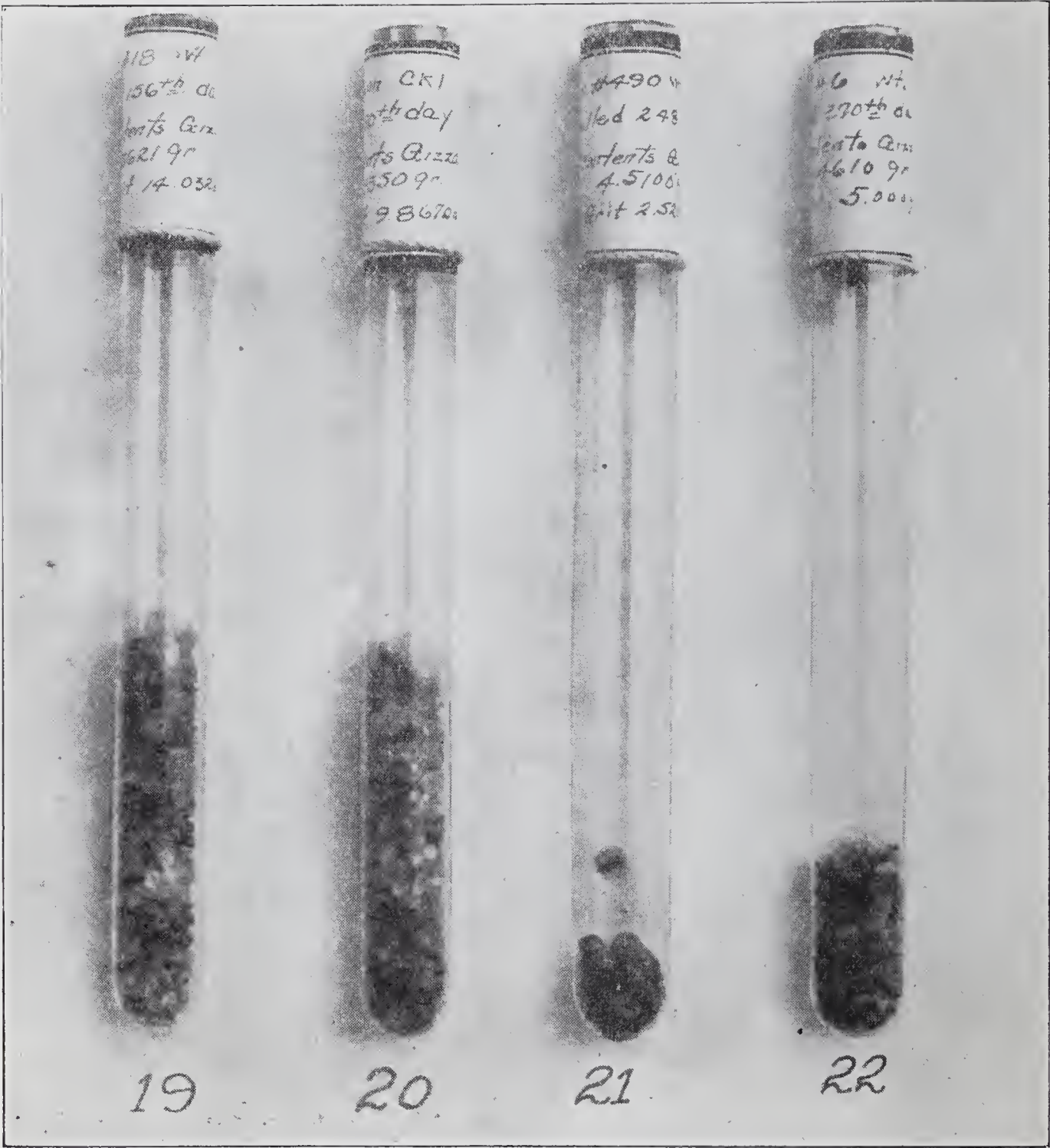


FIG. 12. AMOUNT OF GRIT REMAINING IN THE GIZZARDS OF HENS AT THE END OF EACH PERIOD.

Hen No. 19, killed 156th day.	Wt. gizzard, 17.36 gms.	Wt. grit, 14.05 gms.
Hen No. 20, killed 170th day.	Wt. gizzard, 14.93 gms.	Wt. grit, 9.86 gms.
Hen No. 21, killed 248th day.	Wt. gizzard, 4.51 gms.	Wt. grit, 2.52 gms.
Hen No. 22, killed 270th day.	Wt. gizzard, 10.46 gms.	Wt. grit, 5.00 gms.

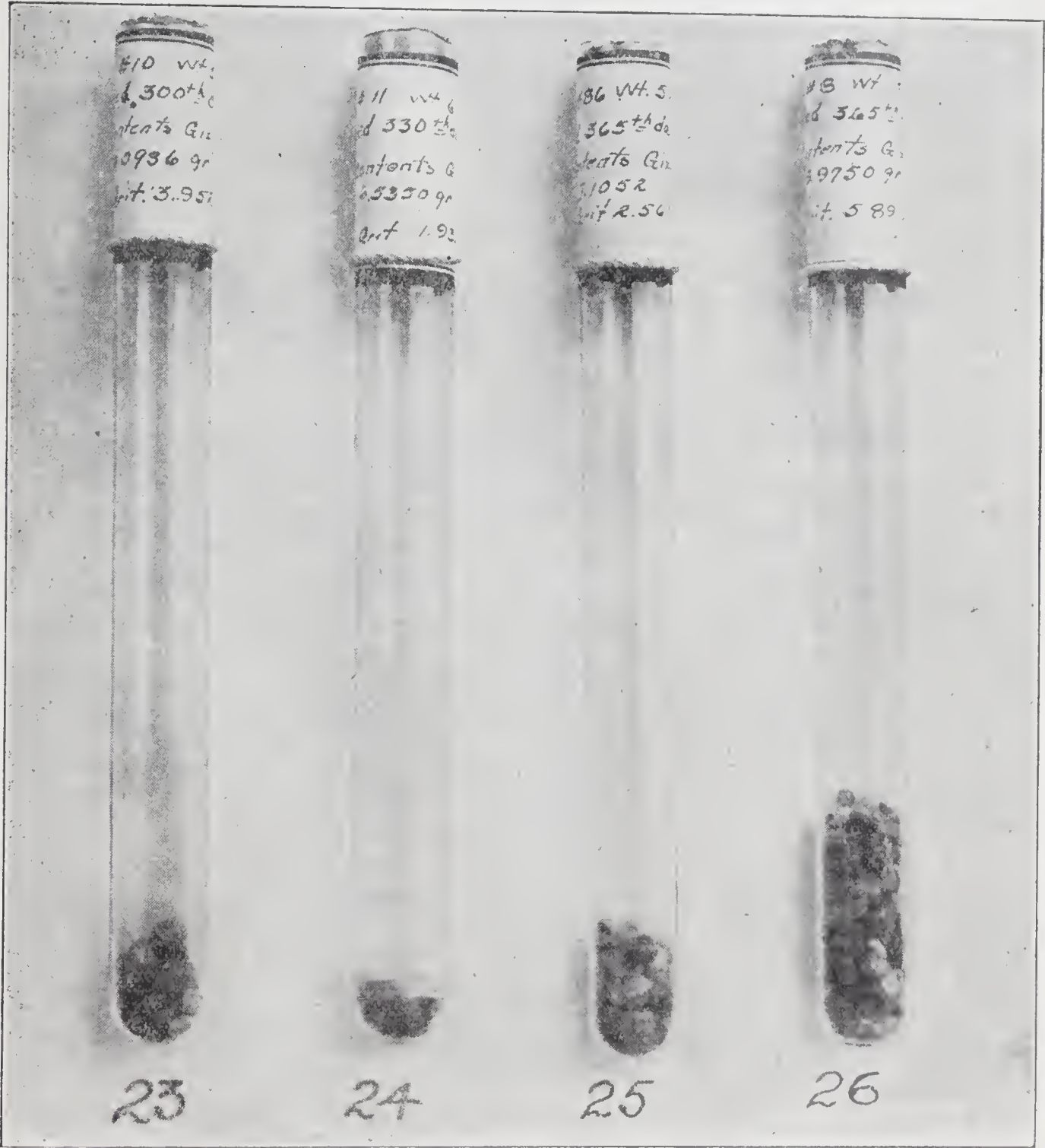


FIG. 13. AMOUNT OF GRIT REMAINING IN THE GIZZARDS OF HENS AT THE END OF EACH PERIOD.

Hen No. 23, killed 300th day.	Wt. gizzard, 10.00 gms.	Wt. grit, 3.95 gms.
Hen No. 24, killed 330th day.	Wt. gizzard, 6.53 gms.	Wt. grit, 1.93 gms.
Hen No. 25, killed 365th day.	Wt. gizzard, 7.10 gms.	Wt. grit, 2.56 gms.
Hen No. 26, killed 365th day.	Wt. gizzard, 9.97 gms.	Wt. grit, 5.89 gms.

TABLE III
PALATABILITY OF SINGLE FEEDS AND COMBINATIONS

Kind of Feed	Letter No.	Breed Used	No. Started	No. Finished	Percent Finished
Wheat middlings-----	A	White P. Rocks-----			
		Buff Rocks-----			
		Buff Orpingtons-----	9	9	100
Corn-----	B	Buff Rock-----	12	5	41
Wheat-----	C	White Rock, Buff Rocks-----	24	6	25
Oats-----	D	Buff Orpington-----	12	6	50
Corn meal (bolted)-----	E	Buff Plymouth Rock-----	12	5	41
Beef scrap and bone meal, 1-3					
Corn meal-2-3-----	F	White Plymouth Rock-----	6	2	33
Tankage-20% Cornmeal-80%	G	White Plymouth Rock-----			
		Buff Orpingtons-----	6	2	33
Blood meal-20%, Corn meal-80%	H	Buff Plymouth Rock-----	6	4	66
Buttermilk (dried),-20%,					
Cornmeal-80%-----	I	Partridge Plymouth Rocks-----	6	5	83
Soybean meal (fat extracted)					
-1-3, Corn meal-2-3-----	J	Barred Plymouth Rocks-----	6	5	83
Peanut meal-1-3, Corn meal					
-2-3-----	K	Barred Plymouth Rocks-----	6	5	83
Fish meal-20%, Corn meal-80%	M	S. C. Rhode Island Reds-----	6	5	83
Cottonseed meal-1-3, Corn					
meal-2-3-----	N	Golden Wyandotte-----	6	4	66
Corn meal (unbolted)-----	O	Barred Plymouth Rocks-----	6	3	50
Wheat middlings-----	P	Buff Orpingtons-----	12	6	50
Rye-----	Q	Silver Pencil Wyandotte			
		Barred Rocks-----	6	0	00
Rye-1-4, Corn-3-4-----	Q	Silver Penciled Wyandottes-----	6	3	50
Rye-50%, Corn meal-50%---	Q	Silver Penciled Wyandottes-----	6	0	00
Hulled Oats-----	R	R. I. Reds-----	6	5	83
Buckwheat-1-4, Corn meal-3-4	S	Barred Plymouth Rocks-----	6	6	100
Rice-1-4, Corn meal-3-4-----	T	Rhode Island Reds-----	6	5	83
Kafir corn-1-4, Corn meal-3-4	U	Silver Penciled Wyandottes-----	6	5	83
Barley-1-4, Corn meal-3-4---	V	Buff Orpingtons-----	3	2	66
Wheat Middlings-1-4, Corn					
meal-3-4-----	W	Barred Plymouth Rocks-----	4	3	75
Total-----	Single Feed-----		105	48	45.7
	Combination-----		79	53	67.4

BEHAVIOR OF BIRDS ON SINGLE FEEDS

The palatability of single feeds as shown by our feeding tests is of considerable interest. In selecting our fowls we chose mature hens of lymphatic temperament. Such hens did not worry in confinement. It appears that the appetite of fowls does not always hold up well on a single feed as it does on a variety.

The feeding tests were run in series of six hens each, one hen in each cage as previously described. The feeding tests extended over a period of eight days. The birds were given a definite number of grams of the feed at 7:30 a. m. and 4:30 p. m.

The breeds of fowls used in these tests were Buff and White Plymouth Rocks and Buff Orpingtons. In the first series one hundred percent finished and the second series fifty percent finished the test. It is also of interest to note that in the test with wheat middlings and corn meal, of the four that started, three, or 75 percent, finished the test. Wheat middling has a tendency to cause a looseness of the bowel on about the fourth day. This seemingly has a tendency to cause the bowel to unload.

Of the twelve Buff Plymouth Rock hens that started on corn, but five, or 41 percent, finished. This put wheat middlings in these tests ahead of corn in palatability.

Of the twenty-four White and Buff Plymouth Rock hens starting on wheat but six, or 25 percent, finished which was the lowest percent of any of the tests to go through.

Of the twelve Buff Orpington hens starting on oats, six, or fifty percent, finished, putting oats slightly ahead of either corn or wheat.

Of the twelve Buff Plymouth Rocks starting on bolted corn meal, only five, or 41 percent, finished, putting it in the class of corn, while of the six Buff Plymouth Rock hens starting on unbolted corn meal, three, or fifty percent, finished.

Of the six Silver Penciled Wyandottes starting on rye and corn meal none finished, but of six Partridge Plymouth Rocks starting on rye and corn meal in a third test, three, or fifty percent finished. Thus of eighteen hens starting on rye in full or as part feed only three or sixteen percent finished. The hens on 100 percent rye developed mild diarrhoea on the second day and severe diarrhoea by the fifth day. The hens on fifty percent rye and fifty percent corn meal developed mild diarrhoea by the fourth day but the diarrhoea did not become severe. The hens on 25 percent rye and 75 percent corn meal did not develop diarrhoea.

Of the three Buff Orpington hens starting on one-fourth part of barley and three-fourths part corn meal, two, or 66 percent, finished.

Of the six Silver Penciled Wyandottes starting on Kafir corn one-fourth part, and corn meal three-fourths part, five, or 83 percent, finished.

Of the six S. C. Rhode Island Red hens starting on one-fourth part rice and three-fourths part corn meal, five, or 83 percent, finished, thus putting rice high as a desirable feed from a tolerance standpoint.

Slightly better than rice was buckwheat. Six Barred Plymouth Rock hens were placed on buckwheat one-fourth part and corn meal three-fourths part with 100 percent finishing the test.

Of six S. C. Rhode Island Red hens starting on hulled oats, five, or 83 percent finished, placing hulled oats ahead of oats.

Of six Golden Wyandotte hens starting on cotton seed meal one-third and corn meal two-thirds, four, or 66 percent, finished the test.

Of six S. C. Rhode Island Reds starting on 20 percent fish meal and 80 percent corn meal, five, or 83 percent, finished, placing fish meal high as a feed from a tolerance standpoint.

Of six Barred Plymouth Rock hens starting on peanut meal one-third and corn meal two-thirds, five, or 83 percent, finished.

Of six Barred Plymouth Rock hens starting on soybean meal one-third and corn meal two-thirds, five, or 83 percent, finished, thus placing both soybean and peanut meals high from a tolerance standpoint. This corresponds with our many practical feeding tests with these two feeds.

Of six Partridge Plymouth Rocks starting on twenty percent dried buttermilk and eighty percent corn meal, five, or 83 percent, finished.

Of six Buff Plymouth Rock hens starting on 20 percent dried blood and 80 percent corn, four, or 66 percent, finished.

Of six White Plymouth Rock and Buff Orpington hens starting on digester tankage 20 percent and corn meal 80 percent, two, or 33 percent, finished. This corresponds to our various series of practical feeding tests that digester tankage, at least some batches, is hard on fowls.

Of six White Plymouth Rock hens starting on beef scrap and bone meal one-third part and corn meal two-thirds part, two, or 33 percent, finished.

In a study of these tests it appears that of 105 hens that started the various tests, but 48 or 45.7 percent, finished the test. Of the 79 started on two feeds, 53, or 67.4 percent, finished the test. From a tolerance standpoint the odds are in favor of more than one feed against the single feed.

SUMMARY OF THE DIGESTIVE COEFFICIENT STUDIES

In a review of research literature we find but eighty-nine individual digestion coefficient tests with poultry. To this we have added 101, making 190 tests to date.

The digestion coefficients with poultry were studies on nineteen feeds. In the case of wheat middlings two series of tests were run with middlings alone and one in combination with unbolted corn meal. Since wheat middlings alone tends to cause looseness of the bowels, it was the desire to determine if this in any way influenced the accuracy of the work. To test this point a series of experiments were run with a combination of wheat middlings and unbolted corn meal. In the case of wheat middlings alone the average digestible organic matter is shown to be 47.72 percent and 56.19 percent with an average of 51.95 percent, while in combination with corn meal the percentage digestible organic matter was 59.78 percent.

In the experiments with corn meal one series of trials was run with bolted and another series with unbolted meal.

Not only did the birds stand up better under more than one feed but apparently one feed favored the increased digestion of the other feed. Some of the feeds, as rye and middlings, if given in their pure form cause irritation of the bowel and looseness and still others, especially those of the animal products group, as digester tankage, meat and bone meal, blood meal, dried buttermilk, and fish meal are so concentrated that it is necessary to give them with other feeds in the digestive tests. In our work we used unbolted corn meal as shown in the tables. Digestion tests had previously been run with the corn meal to determine its digestibility.

Crost in 1900 gave as his results that the crude protein of barley and rye was more digestible than that of oats. We cannot confirm this result as in two tests with barley 72.77 percent of the protein was digested, while in three tests with rye there was 71.85 percent digested and in six tests with oats there was 73.49 percent digested or slightly greater digestion of protein in oats than in either barley or rye, which is the reverse of his findings. Crost further states that the crude fiber of barley and oats was absorbed to a slight degree, but more in the case of rye. In our case 4.33 percent fiber

was digested in barley and in rye 4.68 percent and in oats 11.69 per cent. In our work the fiber of oats ranked first, rye second, with barley closely following. Crost states that the availability of the fat in rye is very low as compared with the fat in oats and barley. In this we agree as the digestibility of the fat of rye was but 27.87 percent, 64.36 for barley, and 74.42 for oats.

Brown in 1904 concludes from his experiments that fowls digest crude protein and nitrogen-free-extract in much greater proportions in corn than in oats, and that wheat falls between the two. In our experiments in five tests with corn there was a total of 83.9 percent organic matter digested and with wheat in six digestion trials ranking second and oats third with 63.78 percent. As to protein, oats rank first with 73.49 percent digested, corn second with 68.71 percent, and wheat third with 61.70 per cent digested. As to nitrogen-free-extract, corn ranks first with 89.40 percent digested, oats second with 88.18 percent, and wheat third with 86.78 percent. Wheat shows a low percentage digestible fat being only 37.76 percent, and oats 74.42 percent. This latter corresponds to Brown's findings. The nutritive value of these three grains we place in the order of corn, wheat, oats. The low fat content of wheat, it being but 2.90 percent, allows of wheat being placed above oats. The order of value of all grains tested based on quantity of digestible nutrients as indicated in these tests is: corn, hulled oats, wheat, kafir corn, rye, barley, oats, buckwheat, and rice.

Our tests confirm those of Bartlett and others, that fowls digest fiber with difficulty. The percentage of fiber varies from 2.16 percent in five tests with fat extracted soybean meal to 11.69 percent in oats. It is quite evident that the fiber content of poultry feeds should be as low as possible. The rapidity of digestion in fowls may be the reason for the low digestibility of fiber. Digestion tests with livestock show that the animals with the longer intestine digest fiber more readily. The low digestibility of fat and fiber in wheat bran leads us to not favor its use as general and in such quantities as used by many poultry men.

Wheat middlings is at the foot of the list in the total digestible pounds in one hundred pounds. This is true studying the first series of nine digestion trials showing 49.99 pounds in one hundred pounds, the second series of six tests with 58.61 pounds, and the third in combination with corn meal with 61.70 pounds in each one hundred pounds. The average of these eighteen tests is 56.76 pounds.

With the exceptions of wheat middlings, meat and bone meal, digester tankage, and blood meal these tests show that fowls are more efficient in the digestion of nitrogen-free-extract than in the digestion of crude protein or fat. These include corn, wheat, oats, corn meal (bolted), buttermilk, (dried) soybean meal (fat extracted), peanut meal (fat extracted), cotton seed meal, corn meal (unbolted), rye, hulled oats, buckwheat, rice, kafir corn, and barley. They are more efficient in digesting fat over protein in corn, oats, corn meal (bolted), meat and bone meal, digester tankage, fish meal, corn meal (unbolted), hulled oats, buckwheat, rice, and kafir corn. They are more efficient in the digestion of protein over fat in wheat middlings, wheat, blood meal, buttermilk (dried), soybean meal (fat extracted), peanut meal (fat extracted), cotton seed meal, rye, and barley.

In studying the digestion results with these eighteen feeds we note that the feeds showing the highest percentage digestible matter are those low in fiber. These are among the grains corn, wheat, hulled oats, rye, and kafir corn and among the by-products corn meal and fat extracted soybean meal, and among all of the animal products. Those feeds that are relatively high in fiber, such as wheat middlings, oats, buckwheat, and rice, are relatively low in total digestible organic matter. This reflects the inability of fowls to use to advantage the coarser feed stuffs and suggests that the feed

mixtures for poultry should contain relatively small proportions of such feeds as alfalfa meal, wheat bran, and wheat middlings. It is believed that rations that carry a low percentage of fiber will give the best results.

The highest percentage of digestion of protein is that of meat and bone meal with fish meal coming a close second, digester tankage ranks third, and blood meal fourth, fat extracted soybean fifth, and dried buttermilk sixth. Fowls assimilate best the protein of animal products

In our tests, numbering 13 in all, the protein of corn meal either bolted or unbolted is digested to better advantage than that of whole corn.

Our tests show 88.18 percent nitrogen-free-extract digested in oats in six tests as compared to sixty-nine by other authors with the exception of Bartlett who gives 90.10 percent. Our hulled oats experiment, five tests, shows 86.22 percent digested by fowls. The feeds high in nitrogen-free-extract can well be used to make up the starch or carbohydrate part of our poultry feeds. Such feeds are corn, wheat, oats, and kafir corn. Kafir corn makes an excellent substitute for wheat and should be used more if the price permits.

With the exception of wheat and wheat middlings the digestion of fat or ether extract is no more variable than for other feeds. Barley is only moderately low, having 64.36 percent of the fat digestible.

TABLE IV
SHOWING COMPOSITION OF POULTRY FEEDS USED IN THESE TESTS

	No. Samples	Water	Ash	Crude Protein	Carbohydrates		
					Fiber	N. F. Ext.	Fat
Wheat middlings	6	9.22	4.43	14.93	6.25	61.06	4.11
Corn	6	10.29	1.61	10.30	2.60	70.10	5.10
Wheat	6	10.10	2.0	12.50	3.10	69.40	2.90
Oats	4	11.65	2.49	11.62	12.08	59.14	3.02
Corn meal (bolted)	6	13.13	1.23	10.10	1.79	68.10	5.65
Meat and bone meal	4	4.52	30.02	38.06	2.05	11.47	13.88
Digester tankage	4	6.4	14.00	58.20	4.60	2.70	14.10
Blood meal	4	9.10	3.70	83.10	-----	3.50	0.60
Butter milk (dried)	4	10.12	6.42	34.16	-----	48.31	0.99
Soybean meal (fat extracted)	4	10.12	5.36	42.10	5.70	29.12	7.60
Peanut meal (fat not extred.)	4	6.10	4.90	21.30	16.60	15.50	35.60
Fish meal	4	9.70	31.10	49.30	-----	-----	9.90
Cottonseed meal	4	8.30	6.90	40.30	9.60	26.80	8.10
Corn meal (unbolted)	4	11.10	2.00	9.10	2.90	69.30	5.60
Wheat middlings	4	9.40	4.20	16.90	8.50	55.90	5.10
Rye	4	10.30	2.20	11.90	3.40	70.10	2.10
Hulled oats	5	8.20	3.10	13.90	1.90	64.20	8.70
Buckwheat	3	10.50	2.90	11.10	8.90	63.60	3.00
Rice	6	8.90	5.30	8.10	10.10	65.60	2.00
Kafir corn	6	11.00	2.10	10.90	3.00	69.80	3.20
Barley	4	10.10	3.20	10.90	5.00	67.90	2.90

TABLE V
SHOWING AVERAGE DIGESTIBILITY OF POULTRY FEEDS IN THESE TESTS

Feed	No. Trials	Organic Matter	Crude Protein	Fat	Carbohydrates	
					Fiber	N. F. Ext.
Wheat middlings	9	47.72	52.91	54.09	8.76	49.99
Corn	5	83.91	68.71	75.26	5.86	89.40
Wheat	6	78.50	61.70	37.76	6.40	86.78
Oats	6	63.78	73.49	74.42	11.69	88.18
Corn meal (bolted)	5	84.67	74.04	86.26	6.66	88.18
Meat and bone meal	2	86.82	92.17	93.13	3.23	76.56
Digester tankage	2	85.50	90.70	91.71	3.94	81.88
Blood meal	4	86.71	88.10	78.36		71.55
Buttermilk (dried)	5	80.79	81.55	78.01		81.14
Soybean meal (fat extracted)	5	77.61	83.33	81.41	2.16	83.14
Peanut meal (fat not extracted)	5	65.94	80.30	78.41	4.08	84.14
Fish meal	5	91.60	91.48	92.24		
Cottonseed meal	4	73.32	81.94	79.05	5.46	82.92
Corn meal (unbolted)	3	83.21	73.50	84.50	6.80	87.60
Wheat middlings	6	56.19	75.43	42.64	10.20	58.61
Rye	3	77.65	71.85	27.87	4.68	83.65
Hulled oats	5	81.75	69.83	84.57	4.91	86.22
Buckwheat	6	70.39	55.93	83.73	6.33	81.25
Rice	5	69.17	73.08	80.00	5.81	78.93
Kafir corn	5	78.72	68.56	75.61	4.45	83.65
Barley	2	75.35	72.77	64.36	4.33	81.46
Wheat middlings	3	59.78	77.57	72.22	4.05	61.70

TABLE VI
SHOWING AVERAGE DIGESTIBLE NUTRIENTS IN 100 LBS. OF FEED IN THESE TESTS

Feed	Total dry Matter lbs.	Crude Protein Lbs.	Fat Lbs.	Carbohydrates		Total lbs.
				Fiber lbs.	N. F. Ext. Lbs.	
Wheat middlings	90.78	7.98	2.22	0.55	30.52	41.27
Corn	89.71	6.98	3.84	0.55	62.67	74.02
Wheat	89.90	7.71	1.09	0.19	60.22	69.21
Oats	88.35	8.53	2.24	1.41	52.14	64.32
Corn meal (bolted)	86.87	7.47	4.87	0.11	60.45	72.90
Meat and bone meal	95.48	35.07	12.92	0.07	8.78	56.84
Digester tankage	93.60	52.78	12.93	0.18	2.21	68.10
Blood meal	90.90	73.21	0.47		2.50	76.18
Buttermilk (dried)	89.88	27.85	0.77		39.19	67.81
Soybean meal (fat extracted)	89.88	35.08	6.18	0.12	24.21	65.59
Peanut meal (fat not extracted)	93.90	17.10	27.91	0.67	13.04	58.72
Fish meal	90.30	45.10	9.13			54.23
Cottonseed meal	91.70	33.02	6.40	0.52	22.22	62.16
Corn meal (unbolted)	88.90	6.67	4.73	0.20	60.71	72.31
Wheat middlings	90.60	12.75	2.17	0.87	32.76	48.55
Rye	89.70	8.55	0.59	0.16	58.64	67.94
Hulled oats	91.80	9.71	7.36	0.09	55.35	72.51
Buckwheat	89.50	6.21	2.51	0.36	51.68	60.96
Rice	91.10	5.92	1.60	0.64	51.78	59.94
Kafir corn	89.00	7.47	2.42	0.13	58.47	68.49
Barley	89.90	7.93	1.87	0.22	55.31	65.33
Wheat middlings	90.60	13.11	3.68	0.34	34.49	51.62

KEY TO TABLES

The letter of the alphabet preceding the numeral refers to the feed used, the numeral refers to the hen number used in the test and also the excrement number. Thus A-1 would mean wheat middlings, hen No. 1 and excrement No. 1.

- A—Wheat middlings.
- B—Corn.
- C—Wheat.
- D—Oats.
- E—Corn meal (bolted).
- F—Beef scrap 1-3, corn meal 2-3.
- G—Tankage 20%, corn meal 80%.
- H—Blood meal 20%, corn meal 80%.
- I—Buttermilk (dried) 20%, corn meal 80%.
- J—Soybean meal (fat extracted) 1-3, corn meal 2-3.
- K—Peanut meal (fat extracted) 1-3, corn meal 2-3.
- M—Fish meal 20%, corn meal 80%.
- N—Cottonseed meal 1-3, corn meal 2-3.
- O—Corn meal (unbolted).
- P—Wheat middlings.
- Q—Rye $\frac{1}{4}$, corn meal $\frac{3}{4}$.
- R—Hulled oats.
- S—Buckwheat $\frac{1}{4}$, corn meal $\frac{3}{4}$.
- T—Rice $\frac{1}{4}$, corn meal $\frac{3}{4}$.
- U—Kafir corn $\frac{1}{4}$, corn meal $\frac{3}{4}$.
- V—Barley $\frac{1}{4}$, corn meal $\frac{3}{4}$.
- W—Wheat middlings $\frac{1}{4}$, corn meal $\frac{3}{4}$.

FEEDING DATA

HEN NO. 301. BREED: WHITE P. ROCK. COOP NO. 1. KIND OF FEED: WHEAT MIDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	10	10	20	30	-----	6.0	Laid
Second day -----	10	12	22	33	-----	6.0	-----
Third day -----	12	15	27	40.5	-----	5.9	-----
Fourth day -----	15	15	30	45	-----	5.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	12	12	24	36	18.5	5.8	-----
Second day -----	12	12	24	36	18.7	5.8	-----
Third day -----	12	12	24	36	15	5.7	-----
Fourth day -----	12	12	24	36	20.5	5.7	-----
Totals -----	48	48	96	144	72.7	-----	-----

Excrement No. A-1.

HEN NO. B36. BREED: WHITE P. ROCK. FEED: WHEAT MIDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	7	10	17	34	-----	5.2	Laid Blood-like Discharge.
Second day -----	10	12	22	44	-----	5.2	-----
Third day -----	12	14	26	52	-----	5.2	-----
Fourth day -----	15	15	30	60	-----	5.2	Laid.

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	12	12	24	36	18.0	5.2	-----
Second day -----	12	12	24	36	18.5	5.2	-----
Third day -----	12	12	24	36	17.5	5.2	-----
Fourth day -----	12	12	24	36	17.7	5.1	-----
Totals -----	48	48	96	144	71.7	-----	-----

Excrement No. A-2.

HEN No. 142. COOP No. 3. BREED: WHITE P. ROCK. FEED: WHEAT MIDDINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	8	12	18	36	-----	5.9	Sluggish
Second day ----	10	12	22	44	-----	5.9	-----
Third day -----	12	12	24	48	-----	5.9	-----
Fourth day ----	12	12	24	48	-----	5.9	Laid

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	12	10	22	33	10.7	5.9	-----
Second day ----	8	9	16	24	19.7	5.8	-----
Third day -----	12	12	24	36	19	5.8	-----
Fourth day ----	12	12	24	36	17.2	5.8	-----
Totals -----	44	44	88	129	66.6	-----	-----

Excrement No. A-3.

HEN No. 150. BREED: WHITE PLYMOUTH ROCK. COOP No. 1. FEED: WHEAT MIDDINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	10	11	21	42	-----	5.9	-----
Second day ----	15	15	30	60	-----	5.9	-----
Third day -----	20	15	35	70	-----	5.9	-----
Fourth day ----	12	10	22	44	-----	5.9	Laid

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	11	12	23	34.5	17	5.9	-----
Second day ----	15	15	30	45	18.5	5.9	-----
Third day -----	15	10	25	37.5	18	5.8	-----
Fourth day ----	15	12	27	40.5	16.5	5.8	-----
Totals -----	56	49	105	157.5	70.0	-----	-----

Excrement No. A-4.

HEN No. 28. BREED: BUFF ROCK. COOP No. 2. FEED: WHEAT MIDDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	10	11	22	44	-----	5.3	-----
Second day ----	15	15	30	60	-----	5.3	-----
Third day -----	20	15	35	70	-----	5.2	-----
Fourth day ----	15	15	30	60	-----	5.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	12	12	24	36	17	5.0	-----
Second day ----	15	15	30	45	17.5	5.0	Laid.
Third day -----	15	15	30	45	15.5	4.9	-----
Fourth day ----	15	15	30	45	24.5	4.9	-----
Totals -----	57	57	114	171	74.5	-----	-----

Exerement No. A-5.

HEN No. 473. BREED: BUFF P. ROCK. COOP No. 3. FEED: WHEAT MIDDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	10	11	22	44	-----	5.5	-----
Second day ----	15	15	30	60	-----	5.5	Laid.
Third day -----	20	15	35	70	-----	5.3	-----
Fourth day ----	15	15	30	60	-----	5.3	Laid.

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	12	12	24	36	20	5.2	-----
Second day ----	15	15	30	45	22	5.2	-----
Third day -----	15	15	30	45	15	5.2	-----
Fourth day ----	15	15	30	45	21	5.2	-----
Totals -----	57	57	114	171	78	-----	-----

Exerement No. A-6.

HEN NO. 152. BREED: BUFF ORPINGTON. COOP NO. 1. FEED: WHEAT MIDDINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	15	15	30	90	-----	7.7	-----
Second day ----	20	20	40	120	-----	7.7	-----
Third day -----	20	20	40	120	-----	7.6	Laid.
Fourth day ----	25	30	55	165	-----	7.5	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	150	42.5	7.5	-----
Second day ----	30	30	60	150	40.0	7.5	-----
Third day -----	30	30	60	150	38	7.4	-----
Fourth day ----	30	30	60	150	30	7.4	-----
Totals -----	120	120	240	660	150	-----	-----

Excrement No. A-7.

HEN NO. 238. BREED: BUFF ORPINGTON. COOP NO. 2. FEED: WHEAT MIDDINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	15	15	30	90	-----	7.3	-----
Second day ----	20	20	40	120	-----	7.3	-----
Third day -----	20	20	40	120	-----	7.3	Laid.
Fourth day ----	25	30	55	165	-----	7.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	44.5	7.1	Laid.
Second day ----	30	30	60	150	30.5	6.9	-----
Third day -----	30	30	60	180	37.0	6.9	-----
Fourth day ----	30	30	60	180	35.0	6.8	-----
Totals -----	120	120	240	660	146	-----	-----

Excrement No. A-8.

HEN No. 171. BREED: BUFF ORPINGTON. COOP No. 3. FEED: WHEAT MIDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	15	15	30	90	-----	6.1	Hen in laying con- dition, but somewhat sluggish.
Second day -----	20	20	40	120	-----	6.1	
Third day -----	20	20	40	120	-----	6.1	
Fourth day -----	25	25	50	150	-----	6.0	

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	25	25	50	125	35.0	6.0	-----
Second day -----	20	20	40	-----	34.5	5.9	-----
Third day -----	25	30	55	145	28.0	5.9	-----
Fourth day -----	30	30	60	180	35.0	5.8	-----
Total -----	100	105	205	575	132	-----	-----

Exerement No. A-9.

HEN No. 10. BREED: BUFF ROCK. COOP No. 1. FEED: CORN.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	15	15	30	60	-----	6.5	-----
Second day -----	20	20	40	80	-----	6.5	-----
Third day -----	20	20	40	80	-----	6.5	-----
Fourth day -----	20	20	40	80	-----	6.5	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	20	20	40	80	8.0	6.5	-----
Second day -----	20	20	40	80	7.0	6.5	-----
Third day -----	20	20	40	80	5.0	6.6	-----
Fourth day -----	20	20	40	80	9.0	6.6	-----
Totals -----	80	80	160	320	29	-----	-----

Excrement No. B-1.

HEN NO. 44. BREED: BUFF ROCK. COOP NO. 2. FEED: CORN.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	15	15	30	60	-----	4.6	-----
Second day ----	20	20	40	80	-----	4.6	Laid.
Third day -----	20	20	40	80	-----	4.6	-----
Fourth day ----	20	20	40	80	-----	4.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	20	20	40	80	8	4.6	-----
Second day ----	20	20	40	80	7.5	4.6	-----
Third day -----	20	20	40	80	6	4.8	-----
Fourth day ----	20	20	40	80	9	4.8	-----
Totals -----	80	80	160	320	30.5	-----	-----

Excrement No. B-2.

HEN NO. 150. BREED: BUFF PLYMOUTH ROCK. COOP NO. 3. FEED: CORN.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	15	15	30	60	-----	5.0	Laid.
Second day ----	20	20	40	80	-----	5.0	Laid.
Third day -----	20	20	40	80	-----	4.9	-----
Fourth day ----	20	20	40	80	-----	4.8	Laid.

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	20	20	40	80	10	4.6	-----
Second day ----	20	20	40	80	9	4.6	Laid.
Third day -----			Refused to eat.			4.5	-----
Fourth day ----			Refused to eat.			4.4	-----
Totals -----	40	40	80	160	19	-----	-----

Excrement No. B-3.

HEN No. 179. BREED: BUFF P. ROCK. COOP No. 4. FEED: CORN.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	15	15	30	60	-----	4.4	-----
Second day	20	20	40	80	-----	4.4	-----
Third day	20	20	40	80	-----	4.4	-----
Fourth day	20	20	40	80	-----	4.4	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	20	20	40	80	8	4.3	-----
Second day	20	20	40	80	8	4.3	-----
Third day	20	20	40	80	7	4.3	-----
Fourth day	20	20	40	80	6	4.3	-----
Totals	80	80	160	320	29	-----	-----

Excrement No. B-4.

HEN No. 148. BREED: BUFF P. ROCK. COOP No. 6. FEED: CORN.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	15	15	30	60	-----	4.6	Laid.
Second day	20	20	40	80	-----	4.6	-----
Third day	20	20	40	80	-----	4.6	-----
Fourth day	20	20	40	80	-----	4.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	20	20	40	80	7	4.6	-----
Second day	20	20	40	80	8	4.6	-----
Third day	20	20	40	80	9	4.6	-----
Fourth day	20	15	35	70	6	4.5	-----
Totals	80	75	155	210	30	-----	-----

Excrement No. B-6.

HEN NO. XX. BREED: WHITE P. ROCK. COOP NO. 1. FEED: WHEAT.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exercement	Wt. Hen	Remarks
First day -----	15	15	30	60	-----	5.4	Laid.
Second day -----	25	20	35	70	-----	5.4	-----
Third day -----	20	20	40	80	-----	5.5	-----
Fourth day -----	20	20	40	80	-----	5.5	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	20	20	40	80	10	5.5	Laid.
Second day -----	20	20	40	80	12	5.5	-----
Third day -----	20	20	40	80	8	5.5	-----
Fourth day -----	20	20	40	80	11	5.4	-----
Totals -----	80	80	160	320	41	-----	-----

Excrement No. C-1.

HEN NO. 00. BREED: WHITE P. ROCK. COOP NO. 2. FEED: WHEAT.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	15	15	30	60	-----	5.2	Laid.
Second day -----	15	20	35	70	-----	5.2	-----
Third day -----	15	5	20	40	-----	5.1	Laid.
Fourth day -----	10	10	20	40	-----	5.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	15	15	30	60	10	5.0	-----
Second day -----	20	20	40	80	13.5	5.0	-----
Third day -----	20	20	40	80	8.0	5.1	-----
Fourth day -----	20	20	40	80	9.0	5.1	-----
Totals -----	75	75	150	300	40.5	-----	-----

Excrement No. C-2.

HEN NO. 20. BREED: WHITE P. ROCK. COOP NO. 3. FEED: WHEAT.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	15	15	30	60	-----	6.3	Laid.
Second day	20	20	40	80	-----	6.3	Laid.
Third day	20	20	40	80	-----	6.2	-----
Fourth day	20	20	40	80	-----	6.1	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	20	20	40	80	10	6.1	-----
Second day	20	20	40	80	15	6.2	-----
Third day	20	20	40	80	11.5	6.2	-----
Fourth day	20	20	40	80	10	6.2	-----
Totals	80	80	120	240	46.5	-----	-----

Excrement No. C-3.

HEN NO. 60. BREED: WHITE P. ROCK. COOP NO. 4. FEED: WHEAT.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	15	15	30	60	-----	4.3	-----
Second day	25	20	45	90	-----	4.3	-----
Third day	-----	15	15	30	-----	4.2	-----
Fourth day	10	10	20	40	-----	4.1	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	15	10	25	50	7	4.0	-----
Second day	20	20	40	80	10	4.0	-----
Third day	20	20	40	80	15	4.0	-----
Fourth day	20	20	40	80	9.5	4.0	-----
Totals	75	70	145	290	41.5	-----	-----

Excrement No. C-4.

HEN NO. 71. BREED: WHITE P. ROCK. COOP NO. 5. FEED: WHEAT.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	15	15	30	60	-----	4.9	Laid.
Second day ----	20	20	40	80	-----	4.8	-----
Third day -----	20	20	40	80	-----	4.7	Laid.
Fourth day ----	20	20	40	80	100	4.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	20	20	40	80	10	4.5	-----
Second day ----	20	20	40	80	10	4.5	-----
Third day -----	20	20	40	80	10	4.6	-----
Fourth day ----	20	20	40	80	10	4.6	-----
Totals -----	80	80	160	320	40	-----	-----

Excrement No. C-5.

HEN NO. 72. BREED: WHITE P. ROCK. COOP NO. 6. FEED: WHEAT.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	15	15	30	60	-----	6.3	Laid.
Secoond day ----	20	20	40	80	-----	6.3	-----
Third day -----	20	20	40	80	-----	6.2	Laid.
Fourth day ----	20	20	40	80	-----	6.1	Laid.

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remark
First day -----	20	20	40	80	5	6.1	Laid.
Second day ----	20	20	40	80	17	6.2	-----
Third day -----	20	20	40	80	10	6.2	-----
Fourth day ----	20	20	40	80	12	6.1	-----
Totals -----	80	80	160	320	44	-----	-----

Excrement No. C-6.

HEN NO. 1. COOP NO. 1. BREED: BUFF ORPINGTON. KIND OF FEED: OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	35	65	-----	-----	6.3	Feed mixed with twice the amount of distilled water.
Second day	30	30	60	-----	-----	6.3	
Third day	30	30	60	-----	-----	6.2	
Fourth day	30	30	60	-----	-----	6.2	

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	-----	18	6.1	Bronchitis The oats had to be finely ground in order to keep hens from going off feed.
Second day	30	30	60	-----	25	6.1	
Third day	30	30	60	-----	32	6.0	
Fourth day	30	30	60	-----	33	6.0	
Total	120	120	240	-----	108	-----	

Excrement No. D-7.

HEN NO. 1. BREED: BUFF ORPINGTON. COOP NO. 2. FEED: OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	-----	-----	6.0	-----
Second day	28	30	58	-----	-----	6.0	-----
Third day	30	30	60	-----	-----	6.0	-----
Fourth day	30	30	60	-----	-----	6.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	-----	20	5.9	Laid today.
Second day	30	30	60	-----	16	5.9	-----
Third day	30	30	60	-----	31	5.9	Laid today.
Fourth day	30	30	60	-----	30	5.8	-----
Total	120	120	240	-----	97	-----	-----

Excrement No. D-8.

HEN NO. 3. BREED: BUFF ORPINGTON. KIND OF FEED: OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	-----	-----	5.6	-----
Second day ----	30	30	60	-----	-----	5.6	-----
Third day -----	30	30	60	-----	-----	5.5	-----
Fourth day ----	30	30	60	-----	-----	5.5	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	18	-----	5.4	-----
Second day ----	30	30	60	15	-----	5.4	-----
Third day -----	30	30	60	35	-----	5.3	-----
Fourth day ----	30	30	60	25	-----	5.3	-----
Total -----	120	120	240	92	-----	5.3	-----

Exerement No. D-9.

HEN NO. 4. BREED: BUFF ORPINGTON. FEED: OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	-----	-----	6.0	-----
Second day ----	30	30	60	-----	-----	6.0	-----
Third day -----	30	30	60	-----	-----	6.0	-----
Fourth day ----	30	30	60	-----	-----	5.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	-----	22	5.8	-----
Second day ----	30	30	60	-----	18	5.7	-----
Third day -----	30	30	60	-----	23	5.7	-----
Fourth day ----	30	30	60	-----	29	5.7	-----
Total -----	120	120	240	-----	92	-----	-----

Exerement No. D-10.

HEN No. 5. BREED: BUFF ORPINGTON. COOP No. 5. FEED: OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	-----	-----	5.4	-----
Second day	30	30	60	-----	-----	5.4	-----
Third day	30	30	60	-----	-----	5.3	-----
Fourth day	30	30	60	-----	-----	5.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	-----	20	5.2	-----
Second day	30	30	60	-----	20	5.1	-----
Third day	30	30	60	-----	19	5.0	-----
Fourth day	30	30	60	-----	28	5.0	-----
Total	120	120	240	-----	87	-----	-----

Excrement No. D-11.

HEN No. 6. BREED: BUFF ORPINGTON. COOP No. 6. FEED: OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	-----	-----	6.1	-----
Second day	30	30	60	-----	-----	6.0	-----
Third day	30	30	60	-----	-----	6.0	-----
Fourth day	30	30	60	-----	-----	6.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	-----	21	6.0	-----
Second day	30	30	60	-----	22	6.0	-----
Third day	30	30	60	-----	22	6.0	-----
Fourth day	30	30	60	-----	23	6.0	-----
Total	120	120	240	-----	89	-----	-----

Excrement No. D-12.

HEN NO. 388. BREED: BUFF ROCK. COOP NO. 2. FEED: CORN MEAL.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	-----	-----	5.5	Laid.
Second day ----	30	30	60	-----	-----	5.4	-----
Third day -----	30	35	65	-----	-----	5.3	Laid.
Fourth day ----	35	35	70	-----	-----	5.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	35	-----	35	70	10	5.2	Laid.
Second day ----	40	35	75	150	15	5.2	-----
Third day -----	35	35	70	140	14	5.2	-----
Fourth day ----	40	35	75	150	15	5.1	-----
Total -----	150	105	255	510	54	-----	-----

Excrement No. E-2.

HEN NO. 149. BREED: BUFF ROCK. COOP NO. 3. FEED: CORN MEAL.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.9	-----
Second day ----	30	30	60	120	-----	4.7	-----
Third day -----	30	35	65	130	-----	4.6	-----
Fourth day ----	35	35	70	140	-----	4.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	35	-----	35	70	10	4.6	-----
Second day ----	40	35	75	150	14.5	4.6	-----
Third day -----	35	35	70	140	11	4.6	-----
Fourth day ----	40	35	75	150	15	4.6	-----
Total -----	150	105	255	510	50.5	-----	-----

Excrement No. E-3.

HEN NO. 203. BREED: BUFF ROCK. COOP NO. 5. FEED: CORN MEAL.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	6.4	Laid.
Second day ----	30	20	50	100	-----	6.3	-----
Third day -----	30	35	65	130	-----	6.3	-----
Fourth day ----	35	35	70	140	-----	6.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	35	-----	35	70	7	6.3	-----
Second day ----	40	35	75	150	10.5	6.3	-----
Third day -----	35	35	70	140	14	6.3	-----
Fourth day ----	40	35	75	150	10	6.2	-----
Total -----	150	105	255	510	41.5	-----	-----

Excrement No. E-5.

HEN NO. 120. BREED: WHITE ROCK. COOP NO. 2. FEED: CORN MEAL.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	35	65	130	-----	4.5	-----
Second day ----	35	35	70	140	-----	4.5	-----
Third day -----	35	35	70	140	-----	4.4	-----
Fourth day ----	35	30	65	130	-----	4.4	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	14	4.4	-----
Second day ----	30	30	60	120	10	4.5	-----
Third day -----	28	30	58	116	10	4.4	-----
Fourth day ----	28	30	58	116	11	4.4	-----
Total -----	116	120	236	472	45	-----	-----

Excrement No. E-8.

HEN NO. 73. BREED: WHITE ROCK. COOP NO. 5. FEED: CORN MEAL.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	35	35	70	140	-----	4.7	-----
Second day -----	35	35	70	140	-----	4.7	-----
Third day -----	35	35	70	140	-----	4.7	-----
Fourth day -----	30	30	60	120	-----	4.7	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	13	4.7	-----
Second day -----	30	30	60	120	8	4.6	-----
Third day -----	30	30	60	120	10	4.5	-----
Fourth day -----	30	30	60	120	12	4.5	-----
Total -----	120	120	240	480	43	-----	-----

Exerement No. E-11.

HEN NO. 374. BREED: BUFF ROCK. COOP NO. 4. FEED: CORN MEAL.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	35	35	70	140	-----	4.8	-----
Second day -----	35	35	70	140	-----	4.7	-----
Third day -----	35	30	65	130	-----	4.7	-----
Fourth day -----	30	30	60	120	-----	4.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	13	4.6	-----
Second day -----	10	0	10	100	10	4.6	Laid.
Third day -----	-----	-----	-----	200	-----	4.5	Off feed.
Fourth day -----	-----	-----	-----	200	-----	4.4	-----
Total -----	40	30	70	620	23	-----	-----

Exerement No. E-10.

HEN NO. 1. BREED: WHITE ROCK. COOP NO. 1. FEED: CORN MEAL 2-3, MEAT SCRAP AND BONE MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120		6.4	
Second day	30	30	60	120		6.4	
Third day	30	30	60	120		6.4	
Fourth day	30	30	60	120		6.5	

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	17	6.5	
Second day	30	30	60	120	17	6.5	
Third day	30	30	60	120	12	6.5	Shows signs of constipation.
Fourth day	30	30	60	120	11.5	6.5	
Total	120	120	240	480	57.5		

Excrement No. F-1.

HEN NO. 2. BREED: WHITE ROCK. COOP NO. 5. FEED: CORN MEAL 2-3, MEAT SCRAP AND BONE MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120		6.1	
Second day	30	30	60	120		6.1	
Third day	30	30	60	120		6	
Fourth day	30	30	60	120		6	

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	12	6	Began to get tired of feed.
Second day	30	30	60	120	17	6	
Third day	30	30	60	120	12	6	
Fourth day	30	30	60	120	13	6	
Total	120	120	240	480	54		

Excrement No. F-5.

HEN No. 230. BREED: WHITE ROCK. COOP No. 1. FEED: CORN MEAL 80%, TANKAGE 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.7	-----
Second day -----	30	30	60	120	-----	4.7	-----
Third day -----	25	30	55	110	-----	4.6	-----
Fourth day -----	30	30	60	120	-----	4.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	20	4.6	-----
Second day -----	30	30	60	120	18	4.6	-----
Third day -----	30	30	60	120	14	4.5	-----
Fourth day -----	30	30	60	120	19	4.4	-----
Total -----	120	120	240	480	71	-----	-----

Excrement No. G-1.

HEN No. 2. BREED: WHITE ROCK. COOP No. 2. FEED: CORN MEAL 80%, TANKAGE 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remark
First day -----	30	30	60	120	-----	6.4	-----
Second day -----	30	30	60	120	-----	6.4	-----
Third day -----	30	30	60	120	-----	6.3	-----
Fourth day -----	25	30	55	110	-----	6.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	19	6.2	-----
Second day -----	30	0	30	60	19	6.2	-----
Third day -----	30	30	60	120	9	6.2	-----
Fourth day -----	30	30	60	120	19	6.2	-----
Total -----	120	90	210	420	66	-----	-----

Excrement No. G-2.

HEN NO. 1. BREED: BUFF ROCK. COOP NO. 1. FEED: CORN MEAL 80%, BLOOD MEAL 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.6	-----
Second day ----	30	30	60	120	-----	5.5	-----
Third day -----	30	30	60	120	-----	5.4	-----
Fourth day ----	30	30	60	120	-----	5.4	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	-----	30	60	10	5.4	-----
Second day ----	30	30	60	120	10	5.4	-----
Third day -----	30	30	60	120	14	5.3	-----
Fourth day ----	30	30	60	120	15	5.3	-----
Total -----	120	90	210	420	49	-----	-----

Excrement No. H-1.

HEN NO. 2. BREED: BUFF ROCK. COOP NO. 3. FEED: CORN MEAL 80%, BLOOD MEAL 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	6.3	-----
Second day ----	30	0	30	60	-----	6.3	-----
Third day -----	30	30	60	120	-----	6.2	-----
Fourth day ----	30	30	60	120	-----	6.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	20	6.1	-----
Second day ----	30	0	30	60	11	6.1	-----
Third day -----	30	0	30	60	10	6.1	-----
Fourth day ----	0	0	-----	-----	-----	-----	-----
Total -----	90	30	120	240	41	-----	-----

Excrement No. H-3.

HEN NO. 3. BREED: BUFF ROCK. COOP NO. 5. FEED: CORN MEAL 80%, BLOOD MEAL 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	6.0	-----
Second day	30	30	60	120	-----	6.0	-----
Third day	30	-----	30	60	-----	5.9	-----
Fourth day	30	30	60	120	-----	5.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	0	30	60	20	5.9	-----
Second day	30	30	60	120	12	5.9	-----
Third day	30	30	60	120	18	5.8	-----
Fourth day	30	30	60	120	19	5.8	-----
Total	120	90	210	420	69	-----	-----

Excrement No. H-5.

HEN NO. 4. BREED: BUFF ROCK. COOP NO. 6. FEED: CORN MEAL 80%, BLOOD MEAL 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	6.4	-----
Second day	30	30	60	120	-----	6.3	-----
Third day	30	30	60	120	-----	6.3	-----
Fourth day	30	30	60	120	-----	6.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	0	30	60	20	6.3	-----
Second day	30	30	60	120	15	6.3	-----
Third day	30	30	60	120	15	6.3	-----
Fourth day	30	30	60	120	17	6.3	-----
Total	120	90	210	420	67	-----	-----

Excrement No. H-6.

HEN No. 1. BREED: PARTRIDGE ROCK. FEED: CORN MEAL 80%, DRIED BUTTERMILK 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.4	-----
Second day	30	30	60	120	-----	5.3	-----
Third day	30	30	60	120	-----	5.3	-----
Fourth day	30	30	60	120	-----	5.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	14	5.2	-----
Second day	30	30	60	120	15	5.2	-----
Third day	30	30	60	120	12	5.2	-----
Fourth day	30	30	60	120	13	5.2	-----
Total	120	120	240	480	54	-----	-----

Excrement No. I-1.

HEN No. 2. BREED: PARTRIDGE ROCK. COOP No. 2. FEED: CORN MEAL 80%, DRIED BUTTER-
MILK, 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	6.1	-----
Second day	30	30	60	120	-----	6.0	-----
Third day	30	30	60	120	-----	6.0	-----
Fourth day	30	30	60	120	-----	6.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	otal	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	14	5.9	-----
Second day	30	30	60	120	15	5.9	-----
Third day	30	30	60	120	15	5.9	-----
Fourth day	30	30	60	120	15	6	-----
Total	120	120	240	480	59	-----	-----

Excrement No. I-2.

HEN NO. 3. BREED: PARTRIDGE ROCK. COOP NO. 3. FEED: CORN MEAL 80%, BUTTERMILK 20 %

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.8	-----
Second day ----	30	30	60	120	-----	5.7	-----
Third day -----	30	30	60	120	-----	5.7	-----
Fourth day ----	0	0	-----	120	-----	5.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	10	5.6	-----
Second day ----	30	30	60	120	10	5.6	-----
Third day -----	30	30	60	120	12	5.6	-----
Fourth day ----		Off Feed		120	-----	5.5	-----
Total -----	90	90	180	480	32	-----	-----

Excrement No. I-3.

HEN NO. 4. BREED: PARTRIDGE ROCK. COOP NO. 4. FEED: CORN MEAL 80%, DRIED BUTTER-MILK, 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	6.4	-----
Second day ----	30	30	60	120	-----	6.3	-----
Third day -----	30	30	60	120	-----	6.2	-----
Fourth day ----	30	30	60	120	-----	6.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	12	6.2	-----
Second day ----	30	30	60	120	10	6.2	-----
Third day -----	30	30	60	120	14	6.2	-----
Fourth day ----	30	30	60	120	13	6.2—	-----
Total -----	120	120	240	480	49	-----	-----

Excrement No. I-4.

HEN NO. 5. BREED: PARTRIDGE ROCK. COOP NO. 5. FEED: CORN MEAL 80%, DRIED BUTTER-MILK, 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.7	-----
Second day	30	30	60	120	-----	5.6	-----
Third day	30	30	60	120	-----	5.5	-----
Fourth day	30	30	60	120	-----	5.5	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	15	5.5	-----
Second day	30	30	60	120	13	5.4	-----
Third day	30	30	60	120	11	5.4	-----
Fourth day	30	30	60	120	10	5.5	-----
Total	120	120	240	480	49	-----	-----

Excrement No. I-5.

HEN NO. 1. BREED: BARRED P. ROCK. COOP NO. 1. FEED: CORN MEAL 2-3, SOYBEAN MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.1	-----
Second day	30	30	60	120	-----	5.1	Laid.
Third day	30	30	60	120	-----	5.1	-----
Fourth day	30	30	60	120	-----	5.1	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	20	5.1	-----
Second day	30	30	60	120	22	5	-----
Third day	30	30	60	120	23	5	-----
Fourth day	30	30	60	120	19	5	-----
Total	120	120	240	480	84	-----	-----

Excrement No. J-1.

HEN NO. 2. BREED: BARRED P. ROCK. COOP NO. 3. FEED: CORN MEAL 2-3, SOYBEAN MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.4	-----
Second day ----	30	30	60	120	-----	5.4	Laid.
Third day -----	30	30	60	120	-----	5.4	-----
Fourth day ----	30	30	60	120	-----	5.4	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	20	5.4	Laid.
Second day ----	30	30	60	120	23	5.4	-----
Third day -----	30	30	60	120	22	5.3	-----
Fourth day ----	30	30	60	120	19	5.3	-----
Total -----	120	120	240	480	84	-----	-----

Excrement No. J-3.

HEN NO. 3. BREED: BARRED P. ROCK. COOP NO. 4. FEED: CORN MEAL 2-3, SOYBEAN MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.0	-----
Second day ----	30	30	60	120	-----	5.0	-----
Third day -----	30	30	60	120	-----	5.0	-----
Fourth day ----	30	30	60	120	-----	4.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	22	4.9	-----
Second day ----	30	30	60	120	25	4.9	-----
Third day -----	30	20	50	110	26	4.8	-----
Fourth day ----		Off feed		120	-----	4.8	-----
Total -----	90	80	170	470	73	-----	-----

Excrement No. J-4.

HEN NO. 4. BREED: BARRED P. ROCK. COOP NO. 5. FEED: CORN MEAL 2-3, SOYBEAN MEAL 1-3.
PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120		6.0	
Second day	30	30	60	120		6	
Third day	30	30	60	120		6.0	
Fourth day	30	30	60	120		6	

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	25	6	
Second day	30	30	60	120	18	6	
Third day	30	30	60	120	22	6 +	
Fourth day	30	30	60	120	20	6.1	
Total	120	120	240	480	85		

Excrement No. J-5.

HEN NO. 5. BREED: BARRED P. ROCK. COOP NO. 6. FEED: CORN MEAL 2-3, SOYBEAN MEAL 1-3.
PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120		5.7	
Second day	30	30	60	120		5.7	
Third day	30	30	60	120		5.7	
Fourth day	30	30	60	120		5.7	

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	22	5.7	
Second day	30	30	60	120	23	5.6	
Third day	30	30	60	120	22	5.6	
Fourth day	30	30	60	120	20	5.5	
Total	120	120	240	480	87		

Excrement No. J-6.

HEN NO. 1. BREED: BARRED PLYMOUTH ROCK. COOP NO. 1. FEED: CORN MEAL 2-3, PEANUT MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.7	-----
Second day	30	30	60	120	-----	5.7	-----
Third day	30	30	60	120	-----	5.6	-----
Fourth day	30	30	60	120	-----	5.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	17	5.5	-----
Second day	30	30	60	120	18	5.5	-----
Third day	30	30	60	120	16	5.5	-----
Fourth day	30	30	60	120	19	5.5	-----
Total	120	120	240	480	70	-----	-----

Excrement No. K-1.

HEN NO. 2. BREED: BARRED PLYMOUTH ROCK. COOP NO. 2. FEED: CORN MEAL 2-3, PEANUT MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	4.9	-----
Second day	30	30	60	120	-----	4.9	-----
Third day	30	30	60	120	-----	4.9	-----
Fourth day	30	30	60	120	-----	4.8	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	16	4.8	-----
Second day	30	30	60	120	19	4.8	-----
Third day	30	30	60	120	20	4.8	-----
Fourth day	30	30	60	120	15	4.7	-----
Total	120	120	240	480	70	-----	-----

Excrement No. K-2.

HEN NO. 3. BREED: BARRED PLYMOUTH ROCK. COOP NO. 3. FEED: CORN MEAL 2-3, PEANUT MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.1	-----
Second day -----	30	30	60	120	-----	5.0	-----
Third day -----	30	30	60	120	-----	5.0	-----
Fourth day -----	30	30	60	120	-----	5.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	20	5.0	-----
Second day -----	30	30	60	120	15	5.0	-----
Third day -----	30	30	60	120	18	5.0	-----
Fourth day -----	30	30	60	120	16	4.9	-----
Total -----	120	120	240	480	69	-----	-----

Excrement No. K-3.

HEN NO. 4. BREED: BARRED PLYMOUTH ROCK. COOP NO. 5. FEED: CORN MEAL 2-3, PEANUT MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.3	-----
Second day -----	30	30	60	120	-----	5.3	-----
Third day -----	30	30	60	120	-----	5.3	-----
Fourth day -----	30	30	60	120	-----	5.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	23	5.2	-----
Second day -----	30	30	60	120	16	5.1	-----
Third day -----	30	30	60	120	20	5.1	-----
Fourth day -----	30	30	60	120	25	5.2	-----
Total -----	120	120	240	480	84	-----	-----

Excrement No. K-5.

HEN NO. 5. BREED: BARRED PLYMOUTH ROCK. COOP NO. 6. FEED: CORN MEAL 2-3, PEANUT MEAL 1-3.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.6	-----
Second day ----	30	30	60	120	-----	4.5	-----
Third day -----	30	30	60	120	-----	4.5	-----
Fourth day ----	30	30	60	120	-----	4.4	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	19	4.4	-----
Second day ----	30	30	60	120	22	4.4	-----
Third day -----	30	30	60	120	20	4.4	-----
Fourth day ----	30	30	60	120	25	4.4	-----
Total -----	120	120	240	480	86	-----	-----

Excrement No. K-6.

HEN NO. 1. BREED: RHODE ISLAND RED. COOP NO. 1. FEED: CORN MEAL 80%, FISH MEAL 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.6	-----
Second day ----	30	30	60	120	-----	4.6	-----
Third day -----	30	30	60	120	-----	4.6	-----
Fourth day ----	30	30	60	120	-----	4.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	14	4.6	-----
Second day ----	30	30	60	120	15	4.6	-----
Third day -----	30	28	58	116	15.5	4.6	-----
Fourth day ----	30	30	60	120	14	4.6	-----
Total -----	120	118	238	476	58.5	-----	-----

Excrement No. M-1.

HEN NO. 2. BREED: RHODE ISLAND RED. COOP NO. 2. FEED: CORN MEAL 80%, FISH MEAL 20%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.7	-----
Second day ----	30	30	60	120	-----	4.7	-----
Third day -----	30	30	60	120	-----	4.7	-----
Fourth day ----	30	30	60	120	-----	4.7	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	25	55	110	13	4.8	-----
Second day ----	30	30	60	120	12.5	4.8	-----
Third day -----	30	30	60	120	16	4.8	-----
Fourth day ----	30	30	60	120	14	4.8	-----
Total -----	120	115	235	470	55	-----	-----

Excrement No. M-2.

HEN NO. 3. BREED: RHODE ISLAND RED. COOP NO. 3. FEED: FISH MEAL 20%, CORN MEAL 80%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.2	-----
Second day ----	30	30	60	120	-----	4.2	-----
Third day -----	30	30	60	120	-----	4.2	-----
Fourth day ----	30	30	60	120	-----	4.2—	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	15	4.2—	-----
Second day ----	30	30	60	120	16	4.2—	-----
Third day -----	30	30	60	120	14	4.2—	-----
Fourth day ----	30	30	60	120	15	4.1	-----
Total -----	120	120	240	480	60	-----	-----

Excrement No. M-3.

HEN NO. 4. BREED: RHODE ISLAND RED. COOP NO. 5. FEED: FISH MEAL 20%, CORN MEAL 80%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	4.3	-----
Second day	30	30	60	120	-----	4.3	-----
Third day	30	30	60	120	-----	4.3	-----
Fourth day	30	30	60	120	-----	4.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	15	4.3	-----
Second day	30	30	60	120	14	4.3	-----
Third day	30	30	60	120	16	4.3	-----
Fourth day	30	30	60	120	14	4.3	-----
Totals	120	120	240	480	59	-----	-----

Excrement No. M-5.

HEN NO. 5. BREED: RHODE ISLAND RED. COOP NO. 6. FEED: FISH MEAL 20%, CORN MEAL 80%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	4.5	-----
Second day	30	30	60	120	-----	4.5	-----
Third day	30	30	60	120	-----	4.5	-----
Fourth day	30	30	60	120	-----	4.5	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	15	4.5	-----
Second day	30	30	60	120	12	4.4	-----
Third day	30	30	60	120	14	4.4	-----
Fourth day	30	30	60	120	13	4.4	-----
Totals	120	120	240	480	54	-----	-----

Excrement No. M-6.

HEN NO. 1. BREED: GOLDEN WYANDOTTE. COOP NO. 1. FEED: COTTONSEED MEAL 1-3, CORN MEAL 2-3*

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.3	-----
Second day	30	30	60	120	-----	5.3	-----
Third day	30	30	60	120	-----	5.3	-----
Fourth day	30	30	60	120	-----	5.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	20	5.3	-----
Second day	30	30	60	120	25	5.3	-----
Third day	30	30	60	120	18	5.3	-----
Fourth day	30	30	60	120	10	5.3	-----
Totals	120	120	240	480	73	-----	-----

Excrement No. N-1.

HEN NO. 2. BREED: GOLDEN WYANDOTTE. COOP NO. 3. FEED: COTTONSEED MEAL 1-3, CORN MEAL 2-3

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	25	55	110	-----	6.0	-----
Second day	30	30	60	120	-----	6.0	-----
Third day	30	20	50	100	-----	6.1	-----
Fourth day	30	30	60	120	-----	6.1	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	23	6.1	-----
Second day	30	30	60	120	25	6.1	-----
Third day	30	30	60	120	14	6.1	-----
Fourth day	30	30	60	120	16	6.0	-----
Totals	120	120	240	480	78	-----	-----

Excrement No. N-3.

HEN NO. 3. BREED: GOLDEN WYANDOTTE. COOP NO. 4. FEED: COTTONSEED MEAL 1-3, CORN MEAL 2-3.
PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	25	30	55	110	-----	4.9	-----
Second day ----	30	30	60	120	-----	4.9	-----
Third day -----	30	30	60	120	-----	4.9	-----
Fourth day ----	20	30	50	100	-----	4.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	22	4.9	-----
Second day ----	30	30	60	120	27	5.0	-----
Third day -----	30	30	60	120	15	5.0	-----
Fourth day ----	30	30	60	120	12	5.0	-----
Totals -----	120	120	240	480	76	-----	-----

Excrement No. N-4.

HEN NO. 4. BREED: GOLDEN WYANDOTTE. COOP NO. 6. FEED: COTTONSEED MEAL 1-3, CORN MEAL 2-3.
PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.7	-----
Second day ----	30	30	60	120	-----	5.7	-----
Third day -----	30	30	60	120	-----	5.7	-----
Fourth day ----	30	30	60	120	-----	5.7	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	25	5.7	-----
Second day ----	30	30	60	120	25	5.7	-----
Third day -----	30	30	60	120	18	5.7	-----
Fourth day ----	30	30	60	120	10	5.8	-----
Totals -----	120	120	240	480	78	-----	-----

Excrement No. N-6.

HEN NO. 1. BREED: BARRED PLYMOUTH ROCK. COOP NO. 2. FEED: CORN MEAL (UNBOLTED)

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.7	-----
Seeond day ----	30	30	60	120	-----		-----
Third day -----	30	30	60	120	-----		-----
Fourth day ----	30	30	60	120	-----		-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	11	5.6	-----
Seeond day ----	30	30	60	120	12	5.6	-----
Third day -----	30	30	60	120	18	5.6	-----
Fourth day ----	30	30	60	120	12	5.6	-----
Totals -----	120	120	240	480	53	-----	-----

Exerement No. O-2.

HEN NO. 2. BREED: BARRED PLYMOUTH ROCK. COOP NO. 3. FEED: CORN MEAL (UNBOLTED).

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.0	-----
Seeond day ----	30	30	60	120	-----		-----
Third day -----	30	30	60	120	-----		-----
Fourth day ----	30	30	60	120	-----		-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	12	5.1	-----
Second day ----	30	30	60	120	10	5.1	-----
Third day -----	30	30	60	120	12	5.1	-----
Fourth day ----	30	30	60	120	19	5.1	-----
Totals -----	120	120	240	480	53	-----	-----

Exerement No. O-3.

HEN NO. 3. BREED: BARRED PLYMOUTH ROCK. COOP NO. 5. FEED: CORN MEAL (UNBOLTED).
PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.3	-----
Second day	30	30	60	120	-----	-----	-----
Third day	30	30	60	120	-----	-----	-----
Fourth day	30	30	60	120	-----	-----	-----

DIGESTION PERIOD							
Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	15	5.2	-----
Second day	30	30	60	120	10	5.2	-----
Third day	30	30	60	120	16	5.2	-----
Fourth day	30	30	60	120	14	5.2	-----
Totals	120	120	240	480	55	-----	-----

Excrement No. O-5.

HEN NO. 1. BREED: BUFF ORPINGTON. COOP NO. 1. FEED: WHEAT MIDLINGS.
PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	4.6	-----
Second day	30	30	60	120	-----	4.6	-----
Third day	30	30	60	120	-----	4.6	-----
Fourth day	30	30	60	120	-----	4.6	-----

DIGESTION PERIOD							
Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	25	4.6	-----
Second day	30	30	60	120	26	4.6	-----
Third day	30	30	60	120	24	4.6	-----
Fourth day	30	30	60	120	27	4.6	-----
Totals	120	120	240	480	102	-----	-----

Excrement No. P-1.

HEN NO. 0. BREED: BARRED PLYMOUTH ROCK. COOP NO. 2. FEED: WHEAT MIDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.3	-----
Second day ----	30	30	60	120	-----	5.3	-----
Third day -----	30	30	60	120	-----	5.2	-----
Fourth day ----	30	30	60	120	-----	5.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	30	5.2	-----
Second day ----	30	30	60	120	30	5.2	-----
Third day -----	30	30	60	120	24	5.2	-----
Fourth day ----	30	30	60	120	25	5.2	-----
Totals -----	120	120	240	480	109	-----	-----

Excrement No. P-2.

HEN NO. 2. BREED: BARRED PLYMOUTH ROCK. COOP NO. 3. FEED: WHEAT MIDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.9	-----
Second day ----	30	30	60	120	-----	4.9	-----
Third day -----	30	30	60	120	-----	4.9	-----
Fourth day ----	30	30	60	120	-----	5.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	27	5.0	-----
Second day ----	30	30	60	120	29	5.0	-----
Third day -----	30	30	60	120	23	5.0	-----
Fourth day ----	30	30	60	120	22	5.0	-----
Totals -----	120	120	240	480	101	-----	-----

Excrement No. P-3.

HEN NO. 3. BREED: BARRED PLYMOUTH ROCK. COOP NO. 4. FEED: WHEAT MIDDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.7	-----
Second day ----	30	30	60	120	-----	5.7	-----
Third day -----	30	30	60	120	-----	5.7	-----
Fourth day ----	30	30	60	120	-----	5.7	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	28	5.7	-----
Second day ----	30	30	60	120	26	5.7	-----
Third day -----	30	30	60	120	18	5.7	-----
Fourth day ----	30	30	60	120	21	5.7	-----
Totals -----	120	120	240	480	110	-----	-----

Exerement No. P-4.

HEN NO. 4. BREED: BARRED PLYMOUTH ROCK. COOP NO. 5. FEED: WHEAT MIDDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	6.0	-----
Second day ----	30	30	60	120	-----	6.0	-----
Third day -----	30	30	60	120	-----	6.0	-----
Fourth day ----	30	30	60	120	-----	5.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	30	5.9	-----
Second day ----	30	30	60	120	28	5.9	-----
Third day -----	30	30	60	120	26	5.9	-----
Fourth day ----	30	30	60	120	25	5.9	-----
Totals -----	120	120	240	480	109	-----	-----

Exerement No. P-5.

HEN NO. 5. BREED: BARRED PLYMOUTH ROCK. COOP NO. 6. FEED: WHEAT MIDLINGS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.3	-----
Second day ----	30	30	60	120	-----	4.3	-----
Third day -----	30	30	60	120	-----	4.3	-----
Fourth day ----	30	30	60	120	-----	4.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	27	4.3	-----
Second day ----	30	30	60	120	29	4.4	-----
Third day -----	30	30	60	120	28	4.4	-----
Fourth day ----	30	30	60	120	26	4.4	-----
Totals -----	120	120	240	480	110	-----	-----

Exerement No. P-6.

HEN NO. 120. BREED: PARTRIDGE ROCK. COOP NO. 1. FEED: RYE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.6	-----
Second day ----	30	30	60	120	-----	5.6	-----
Third day -----	30	30	60	120	-----	5.6	-----
Fourth day ----	30	30	60	120	-----	5.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	15	5.6	-----
Second day ----	30	-----	30	60	18	5.6	-----
Third day -----	30	30	60	120	13	5.6	-----
Fourth day ----	30	30	60	120	16	5.6	-----
Totals -----	120	90	210	420	62	-----	-----

Excrement No. Q-1.

HEN NO. 36. BREED: PARTRIDGE ROCK. COOP NO. 2. FEED: RYE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	6.0	-----
Second day ----	30	30	60	120	-----	6.0	-----
Third day -----	30	30	60	120	-----	6.1	-----
Fourth day ----	30	30	60	120	-----	6.1	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	16	6.0	-----
Second day ----	30	-----	30	60	14	6.0	-----
Third day -----	30	30	60	120	12	6.0	-----
Fourth day ----	30	30	60	120	19	6.0	-----
Totals -----	120	90	210	420	61	-----	-----

Excrement No. Q-2.

HEN NO. 41. BREED: PARTRIDGE ROCK. COOP NO. 3. FEED: RYE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.8	-----
Second day ----	30	30	60	120	-----	5.8	-----
Third day -----	30	30	60	120	-----	5.8	-----
Fourth day ----	30	30	60	120	-----	5.8	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	19	5.8	-----
Second day ----	30	-----	30	60	13	5.8	-----
Third day -----	30	30	60	120	11	5.8	-----
Fourth day ----	30	30	60	120	18	5.8	-----
Totals -----	120	90	210	420	61	-----	-----

Excrement No. Q-3.

HEN NO. 81. BREED: RHODE ISLAND RED. COOP NO. 1. FEED: HULLED OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.2	-----
Second day ----	30	30	60	120	-----	5.2	-----
Third day -----	30	30	60	120	-----	5.2	-----
Fourth day ----	30	30	60	120	-----	5.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	13	5.2	-----
Second day ----	30	30	60	120	15	5.2	-----
Third day -----	30	30	60	120	17	5.2	-----
Fourth day ----	30	30	60	120	15	5.2	-----
Totals -----	120	120	240	480	60	-----	-----

Excrement No. R-1.

HEN NO. 13. BREED: RHODE ISLAND RED. COOP NO. 2. FEED: HULLED OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.6	-----
Second day ----	30	30	60	120	-----	4.6	-----
Third day -----	30	30	60	120	-----	4.6	-----
Fourth day ----	30	30	60	120	-----	4.5	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	14	4.5	-----
Second day ----	30	30	60	120	13	4.6	-----
Third day -----	30	30	60	120	14	4.6	-----
Fourth day ----	30	30	60	120	16	4.6	-----
Totals -----	120	120	240	480	57	-----	-----

Excrement No. R-2.

HEN No. 32. BREED: RHODE ISLAND RED. COOP No. 3. FEED: HULLED OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.0	-----
Second day ----	30	30	60	120	-----	5.0	-----
Third day -----	30	30	60	120	-----	5.0	-----
Fourth day ----	30	30	60	120	-----	5.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	11	4.9	-----
Second day ----	30	30	60	120	13	4.9	-----
Third day -----	30	30	60	120	16	4.9	-----
Fourth day ----	30	30	60	120	14	4.9	-----
Totals -----	120	120	240	480	54	-----	-----

Excrement No. R-3.

HEN No. 37. BREED: RHODE ISLAND RED. COOP No. 4. FEED: HULLED OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.8	-----
Second day ----	30	30	60	120	-----	4.8	-----
Third day -----	30	30	60	120	-----	4.8	-----
Fourth day ----	30	30	60	120	-----	4.8	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	15	4.9	-----
Second day ----	30	30	60	120	17	4.9	-----
Third day -----	30	30	60	120	16	4.9	-----
Fourth day ----	30	30	60	120	18	4.9	-----
Totals -----	120	120	240	480	66	-----	-----

Excrement No. R-4.

HEN NO. 53. BREED: RHODE ISLAND RED. COOP NO. 5. FEED: HULLED OATS.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.3	-----
Second day ----	30	30	60	120	-----	4.3	-----
Third day -----	30	30	60	120	-----	4.3	-----
Fourth day ----	30	30	60	120	-----	4.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	17	4.3	-----
Second day ----	30	30	60	120	20	4.3	-----
Third day -----	30	30	60	120	17	4.3	-----
Fourth day ----	30	30	60	120	19	4.3	-----
Totals -----	120	120	240	480	73	-----	-----

Excrement No. R-5.

HEN NO. 11. BREED: BARRED PLYMOUTH ROCK. COOP NO. 1. FEED: BUCKWHEAT 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.2	-----
Second day ----	30	30	60	120	-----	5.2	-----
Third day -----	30	30	60	120	-----	5.2	-----
Fourth day ----	30	30	60	120	-----	5.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	12	5.1	-----
Second day ----	30	30	60	120	13	5.1	-----
Third day -----	30	30	60	120	12	5.1	-----
Fourth day ----	30	30	60	120	14	5.1	-----
Totals -----	120	120	240	480	51	-----	-----

Excrement No. S-1.

HEN NO. 32. BREED: BARRED PLYMOUTH ROCK. COOP NO. 2. FEED: BUCKWHEAT 25%, CORN MEAL 75%

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.2	-----
Second day ----	30	30	60	120	-----	4.2	-----
Third day -----	30	30	60	120	-----	4.2	-----
Fourth day ----	30	30	60	120	-----	4.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	13	4.2	-----
Second day ----	30	30	60	120	13	4.2	-----
Third day -----	30	30	60	120	15	4.2	-----
Fourth day ----	30	30	60	120	15	4.2	-----
Totals -----	120	120	240	480	57	-----	-----

Excrement No. S-2.

HEN NO. 43. BREED: BARRED PLYMOUTH ROCK. COOP NO. 3. FEED: BUCKWHEAT 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.7	-----
Second day ----	30	30	60	120	-----	4.7	-----
Third day -----	30	30	60	120	-----	4.7	-----
Fourth day ----	30	30	60	120	-----	4.7	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	13	4.7—	-----
Second day ----	30	30	60	120	12	4.6	-----
Third day -----	30	30	60	120	13	4.6	-----
Fourth day ----	30	30	60	120	14	4.6	-----
Totals -----	120	120	240	480	52	-----	-----

Excrement No. S-3.

HEN No. 54. BREED: BARRED PLYMOUTH ROCK. COOP No. 4. FEED: BUCKWHEAT 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.2	-----
Second day	30	30	60	120	-----	5.2	-----
Third day	30	30	60	120	-----	5.2	-----
Fourth day	30	30	60	120	-----	5.2	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	14	5.3	-----
Second day	30	30	60	120	13	5.3	-----
Third day	30	30	60	120	12	5.3	-----
Fourth day	30	30	60	120	14	5.3	-----
Totals	120	120	240	480	53	-----	-----

Exerement No. S-4.

HEN No. 65. BREED: BARRED PLYMOUTH ROCK. COOP No. 5. FEED: BUCKWHEAT 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day	20	25	45	90	-----	6.0	-----
Second day	30	30	60	120	-----	6.0	-----
Third day	30	30	60	120	-----	6.0	-----
Fourth day	30	30	60	120	-----	6.0	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	14	6.0	-----
Second day	30	30	60	120	14	6.0	-----
Third day	30	30	60	120	12	6.0	-----
Fourth day	30	30	60	120	13	6.0	-----
Totals	120	120	240	480	53	-----	-----

Excrement No. S-5.

HEN NO. 76. BREED: BARRED PL. MOUTH ROCK. COOP NO. 6. FEED: BUCKWHEAT 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.4	-----
Second day -----	30	30	60	120	-----	5.4	-----
Third day -----	30	30	60	120	-----	5.4	-----
Fourth day -----	30	30	60	120	-----	5.4—	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	11	5.3	-----
Second day -----	30	30	60	120	10	5.3	-----
Third day -----	30	30	60	120	20	5.3	-----
Fourth day -----	30	30	60	120	14	5.3—	-----
Totals -----	120	120	240	480	55	-----	-----

Excrement No. S-6.

HEN NO. 87. RHODE ISLAND RED. COOP NO. 1. FEED: RICE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.1	-----
Second day -----	30	30	60	120	-----	5.1	-----
Third day -----	30	30	60	120	-----	5.1	-----
Fourth day -----	30	30	60	120	-----	5.1	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	14	5.1	-----
Second day -----	30	-----	30	60	16	5.1	-----
Third day -----	30	30	60	120	13	5.1	-----
Fourth day -----	30	30	60	120	19	5.1	-----
Totals -----	120	90	210	420	62	-----	-----

Excrement No. T-1.

HEN No. 98. BREED: RHODE ISLAND RED. COOP No. 2. FEED: RICE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	6.0	-----
Second day -----	30	30	60	120	-----	6.0-	-----
Third day -----	30	30	60	120	-----	5.9	-----
Fourth day -----	30	30	60	120	-----	5.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	14	5.9	-----
Second day -----	30	-----	30	60	13	5.9	-----
Third day -----	30	30	60	120	20	5.9	-----
Fourth day -----	30	30	60	120	18	5.9	-----
Totals -----	120	90	210	420	65	-----	-----

Excrement No. T-2.

HEN No. 23. BREED: RHODE ISLAND RED. COOP No. 3. FEED: RICE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.3	-----
Second day -----	30	30	60	120	-----	4.3	-----
Third day -----	30	30	60	120	-----	4.3	-----
Fourth day -----	30	30	60	120	-----	4.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	18	4.3	-----
Second day -----	30	-----	30	60	16	4.4	-----
Third day -----	30	30	60	120	14	4.4	-----
Fourth day -----	30	30	60	120	13	4.4	-----
Totals -----	120	90	210	420	61	-----	-----

Excrement No. T-3.

HEN NO. 34. BREED: RHODE ISLAND RED. COOP NO. 4. FEED: RICE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.6	-----
Second day ----	30	30	60	120	-----	5.6	-----
Third day -----	30	30	60	120	-----	5.6	-----
Fourth day ----	30	30	60	120	-----	5.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	17	5.6	-----
Second day ----	30	-----	30	60	12	5.6	-----
Third day -----	30	30	60	120	16	5.6	-----
Fourth day ----	30	30	60	120	18	5.6	-----
Totals -----	120	90	210	420	63	-----	-----

Excrement No. T-4.

HEN NO. 45. BREED: RHODE ISLAND RED. COOP NO. 5. FEED: RICE 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.4	-----
Second day ----	30	30	60	120	-----	5.4	-----
Third day -----	30	30	60	120	-----	5.4	-----
Fourth day ----	30	30	60	120	-----	5.4	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	15	5.5	-----
Second day ----	30	-----	30	60	17	5.5	-----
Third day -----	30	30	60	120	14	5.5	-----
Fourth day ----	30	30	60	120	16	5.5	-----
Totals -----	120	90	210	420	62	-----	-----

Excrement No. T-5.

HEN NO. 56. SILVER PENCILLED WYANDOTTE. COOP NO. 1. FEED: KAFIR CORN 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	5.6	-----
Second day -----	30	30	60	120	-----	5.6	-----
Third day -----	30	-----	30	60	-----	5.6	-----
Fourth day -----	30	30	60	120	-----	5.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	14	5.6	-----
Second day -----	30	30	60	120	17	5.6	-----
Third day -----	30	30	60	120	13	5.6	-----
Fourth day -----	30	30	60	120	11	5.7	-----
Totals -----	120	120	240	480	55	-----	-----

Excrement No. U-1.

HEN NO. 67. BREED: SILVER PENCILLED WYANDOTTE. COOP NO. 2. FEED: KAFIR CORN 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.6	-----
Second day -----	30	30	60	120	-----	4.6	-----
Third day -----	30	30	60	120	-----	4.6	-----
Fourth day -----	30	-----	30	60	-----	4.6-	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day -----	30	30	60	120	17	4.5	Slightly
Second day -----	30	30	60	120	16	4.5	constipated
Third day -----	30	30	60	120	11	4.5	-----
Fourth day -----	30	30	60	120	12	4.5	-----
Totals -----	120	120	240	480	56	-----	-----

Excrement No. U-2.

Hen No. 78. BREED: SILVER PENCILLED WYANDOTTE. COOP No. 3. FEED: KAFIR CORN 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.1	-----
Second day	30	30	60	120	-----	5.1	-----
Third day	30	30	60	120	-----	5.1	Slightly
Fourth day	30	-----	30	60	-----	5.1	constipated

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	19	5.2	-----
Second day	30	30	60	120	13	5.2	-----
Third day	30	30	60	120	14	5.2	-----
Fourth day	30	30	60	120	12	5.2	-----
Totals	120	120	240	480	58	-----	-----

Excrement No. U-3.

HEN No. 89. BREED: SILVER PENCILLED WYANDOTTE. COOP No. 4. FEED: KAFIR CORN 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	4.9	-----
Second day	30	-----	30	60	-----	4.9	-----
Third day	30	30	60	120	-----	4.9	-----
Fourth day	30	30	60	120	-----	4.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	11	4.9	Constipated
Second day	30	30	60	120	19	4.9	-----
Third day	30	30	60	120	16	4.9	-----
Fourth day	30	30	60	120	13	4.9	-----
Totals	120	120	240	480	59	-----	-----

Excrement No. U-4.

HEN NO. 35. BREED: SILVER PENCILLED WYANDOTTE. COOP NO. 5. FEED: KAFIR CORN 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Fced	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	4.0	-----
Second day	30	-----	30	60	-----	4.0	-----
Third day	30	30	60	120	-----	4.0	-----
Fourth day	30	30	60	120	-----	4.0	Slightly constipated

DIGESTION PERIOD

Day	M. Fced	N. Fced	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	14	4.0	-----
Second day	30	30	60	120	18	4.1	-----
Third day	30	30	60	120	12	4.1	-----
Fourth day	30	30	60	120	10	4.1	-----
Totals	120	120	240	480	54	-----	-----

Excrement No. U-5.

HEN NO. 46. BREED: BUFF ORPINGTON. COOP NO. 1. FEED: BARLEY 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	-----	5.9	-----
Second day	30	30	60	120	-----	5.9	-----
Third day	30	30	60	120	-----	5.9-	-----
Fourth day	30	30	60	120	-----	5.9-	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day	30	30	60	120	15	5.8	-----
Second day	30	30	60	120	13	5.8	-----
Third day	30	30	60	120	16	5.8	-----
Fourth day	30	30	60	120	14	5.8	-----
Totals	120	120	240	480	58	-----	-----

Excrement No. V-1.

HEN NO. 57. BREED: BUFF ORPINGTON. COOP NO. 2. FEED: BARLEY 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	6.3	-----
Second day ----	30	30	60	120	-----	6.3	-----
Third day -----	30	30	60	120	-----	6.3	-----
Fourth day ----	30	30	60	120	-----	6.3	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	16	6.3	-----
Second day ----	30	30	60	120	14	6.3	-----
Third day -----	30	30	60	120	15	6.3	-----
Fourth day ----	30	30	60	120	17	6.3	-----
Totals -----	120	120	240	480	62	-----	-----

Excrement No. V-2.

HEN NO. 68. BREED: BARRED PLYMOUTH ROCK. COOP NO. 1. FEED: WHEAT MIDDINGS 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	-----	4.7	-----
Second day ----	30	30	60	120	-----	4.7	-----
Third day -----	30	30	60	120	-----	4.7	-----
Fourth day ----	30	30	60	120	-----	4.7	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Excrement	Wt. Hen	Remarks
First day -----	30	30	60	120	15	4.7	-----
Second day ----	30	30	60	120	19	4.7	-----
Third day -----	30	30	60	120	18	4.7	-----
Fourth day ----	30	30	60	120	17	4.7	-----
Totals -----	120	120	240	480	69	-----	-----

Excrement No. W-1.

HEN NO. 79. BREED: BARRED PLYMOUTH ROCK. COOP NO. 2. FEED: WHEAT MIDDLINGS 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day	30	20	50	100	-----	5.6	-----
Second day	15	30	45	95	-----	5.6	-----
Third day	30	30	30	120	-----	5.6	-----
Fourth day	25	30	55	110	-----	5.6	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day	30	30	60	120	16	5.7	-----
Second day	30	30	60	120	18	5.7	-----
Third day	30	30	60	120	14	5.7	-----
Fourth day	30	30	60	120	20	5.7	-----
Totals	120	120	240	480	68	-----	-----

Exerement No. W-2.

HEN NO. 28. BREED: BARRED PLYMOUTH ROCK. COOP NO. 3. FEED: WHEAT MIDDLINGS 25%, CORN MEAL 75%.

PRELIMINARY PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day	20	15	35	70	-----	5.9	-----
Second day	25	25	50	100	-----	5.9	-----
Third day	30	25	55	110	-----	5.9	-----
Fourth day	30	30	60	120	-----	5.9	-----

DIGESTION PERIOD

Day	M. Feed	N. Feed	Total	Water	Exerement	Wt. Hen	Remarks
First day	30	30	60	120	20	5.9	-----
Second day	30	30	60	120	14	6.0	-----
Third day	30	30	60	120	16	6.0	-----
Fourth day	30	30	60	120	17	6.0	-----
Totals	120	120	240	480	67	-----	-----

Exerement No. W-3.

EXCREMENT ANALYSIS

	Excrement A-1	Excrement A-2	Excrement A-3
Moisture.....	10.91	10.37	10.55
Total nitrogen.....	6.01	6.03	6.01
Uric acid nitrogen.....	3.78	3.72	3.69
Ammonia nitrogen.....	.64	.57	.60
Ether extract.....	2.75	2.64	2.56
Crude fiber.....	7.49	8.44	7.10
Nitrogen free extract.....	45.21	45.67	44.18
Uric acid.....	11.46	11.29	11.08
Ammonia.....	.80	.70	.73
Ash.....	11.44	10.05	13.05
Crude protein.....	9.94	10.84	10.74

	Excrement A-4	Excrement A-5	Excrement A-6
Moisture.....	9.17	8.93	9.20
Total nitrogen.....	6.74	6.50	6.41
Uric acid nitrogen.....	3.80	3.82	3.77
Ammonia nitrogen.....	.74	.66	.69
Ether extract.....	2.77	3.19	3.25
Crude fiber.....	8.60	8.79	8.47
Nitrogen free extract.....	45.22	42.61	45.54
Uric acid.....	11.38	11.46	11.29
Ammonia.....	.90	.81	.85
Ash.....	8.24	11.59	9.25
Crude protein.....	13.71	12.62	12.15

	Excrement A-7	Excrement A-8	Excrement A-9
Moisture.....	10.63	9.85	9.83
Total nitrogen.....	6.01	6.02	6.03
Uric acid nitrogen.....	3.80	3.84	3.80
Ammonia nitrogen.....	.66	.71	.70
Ether extract.....	2.88	2.76	2.81
Crude fiber.....	8.11	8.45	8.81
Nitrogen free extract.....	46.81	47.42	47.57
Uric acid.....	11.40	11.50	11.38
Ammonia.....	.81	.87	.84
Ash.....	9.74	10.00	9.20
Crude protein.....	9.62	9.15	9.56

EXCREMENT ANALYSIS—Continued.

	Excrement B-1	Excrement B-2	Excrement B-3
Moisture.....	4.91	6.52	3.59
Total nitrogen.....	6.10	6.43	6.18
Uric acid nitrogen.....	3.33	3.13	3.15
Ammonia nitrogen.....	.24	.36	.44
Ether extract.....	4.15	5.34	5.45
Crude fiber.....	13.55	12.82	10.36
Nitrogen free extract.....	40.57	38.47	40.24
Uric acid.....	9.99	9.40	9.48
Ammonia.....	.29	.42	.53
Ash.....	10.72	8.86	14.16
Crude protein.....	15.81	18.17	16.19

	Excrement B-4	Excrement B-6	Excrement C-1
Moisture.....	5.12	5.84	6.44
Total nitrogen.....	6.38	6.06	6.58
Uric acid nitrogen.....	3.38	3.10	2.63
Ammonia nitrogen.....	.29	.55	.98
Ether extract.....	8.63	8.62	5.42
Crude fiber.....	13.44	10.26	10.30
Nitrogen free extract.....	33.27	37.58	31.36
Uric acid.....	10.16	9.32	7.89
Ammonia.....	.35	.68	1.16
Ash.....	12.10	12.64	18.77
Crude protein.....	16.93	15.06	18.65

	Excrement C-2	Excrement C-3	Excrement C-4
Moisture.....	8.02	7.46	8.23
Total nitrogen.....	5.88	5.95	6.15
Uric acid nitrogen.....	2.82	2.66	2.74
Ammonia nitrogen.....	.31	.62	.71
Ether extract.....	7.50	7.48	5.54
Crude fiber.....	12.07	9.32	11.11
Nitrogen free extract.....	32.55	38.50	35.10
Uric acid.....	8.48	7.98	8.23
Ammonia.....	.38	.76	.86
Ash.....	13.82	11.82	14.10
Crude protein.....	17.18	16.68	16.82

EXCREMENT ANALYSIS—*Continued.*

	Excrement C-5	Excrement C-6	Excrement D-7
Moisture.....	7.07	7.65	9.33
Total nitrogen.....	6.07	5.97	3.95
Uric acid nitrogen.....	2.60	2.43	2.28
Ammonia nitrogen.....	.46	.64	.42
Ether extract.....	6.40	7.55	1.99
Crude fiber.....	11.93	11.50	21.54
Nitrogen free extract.....	31.27	33.26	41.49
Uric acid.....	7.81	7.30	6.84
Ammonia.....	.56	.78	.51
Ash.....	16.18	13.83	10.46
Crude protein.....	18.77	18.12	7.84

	Excrement D-8	Excrement D-9	Excrement D-10
Moisture.....	9.06	6.42	6.12
Total nitrogen.....	4.18	4.00	3.67
Uric acid nitrogen.....	2.23	2.24	2.17
Ammonia nitrogen.....	.52	.52	.42
Ether extract.....	1.86	1.83	1.86
Crude fiber.....	26.96	29.00	27.39
Nitrogen free extract.....	37.70	37.50	44.06
Uric acid.....	6.68	6.12	6.51
Ammonia.....	.63	.63	.51
Ash.....	8.15	10.74	6.82
Crude protein.....	8.96	7.75	6.73

	Excrement D-11	Excrement D-12	Excrement E-2
Moisture.....	4.91	4.18	10.16
Total nitrogen.....	3.84	3.78	5.90
Uric acid nitrogen.....	2.12	2.05	3.33
Ammonia nitrogen.....	.48	.49	.58
Ether extract.....	2.10	2.16	3.37
Crude fiber.....	30.85	29.38	8.27
Nitrogen free extract.....	44.59	44.61	43.50
Uric acid.....	6.38	6.17	9.99
Ammonia.....	.58	.59	.70
Ash.....	2.63	5.19	11.58
Crude Protein.....	7.96	7.72	12.43

EXCREMENT ANALYSIS—Continued.

	Excrement E-3	Excrement E-5	Excrement E-8
Moisture.....	11.13	10.91	9.36
Total nitrogen.....	5.96	6.47	5.98
Uric acid nitrogen.....	2.99	3.38	3.27
Ammonia nitrogen.....	.72	.58	.68
Ether extract.....	3.96	4.91	3.88
Crude fiber.....	8.65	9.50	9.00
Nitrogen free extract.....	42.19	40.09	46.15
Uric acid.....	8.98	10.16	9.82
Ammonia.....	.87	.64	.82
Ash.....	10.16	7.83	8.29
Crude protein.....	14.06	15.96	12.68

	Excrement E-11	Excrement F-1	Excrement F-5
Moisture.....	8.67	10.17	9.16
Total nitrogen.....	6.42	9.97	9.84
Uric acid nitrogen.....	3.38	7.05	6.92
Ammonia nitrogen.....	.64	1.07	1.00
Ether extract.....	4.79	3.28	3.98
Crude fiber.....	9.03	7.39	7.88
Nitrogen free extract.....	41.07	26.22	27.74
Uric acid.....	10.16	21.16	20.76
Ammonia.....	.77	1.31	1.22
Ash.....	10.54	18.86	17.24
Crude protein.....	14.97	11.61	12.02

	Excrement G-1	Excrement G-2	Excrement H-1
Moisture.....	16.01	18.00	8.19
Total nitrogen.....	8.93	8.35	10.85
Uric acid nitrogen.....	6.60	6.21	7.44
Ammonia nitrogen.....	.58	.55	.76
Ether extract.....	2.76	2.86	2.77
Crude fiber.....	7.49	7.04	5.71
Nitrogen free extract.....	22.09	20.80	28.49
Uric acid.....	19.81	18.63	22.31
Ammonia.....	.70	.69	.92
Ash.....	20.17	22.03	15.00
Crude protein.....	10.97	9.97	16.61

EXCREMENT ANALYSIS—*Continued.*

	Excrement H-3	Excrement H-5	Excrement H-6
Moisture.....	9.31	12.18	13.13
Total nitrogen.....	10.00	10.36	10.37
Uric acid nitrogen.....	6.96	7.38	7.32
Ammonia nitrogen.....	.80	.96	.78
Ether extract.....	2.83	2.00	2.04
Crude fiber.....	5.88	4.05	4.18
Nitrogen free extract.....	30.07	20.23	20.80
Uric acid.....	20.87	22.13	21.96
Ammonia.....	.97	1.16	.94
Ash.....	16.05	25.60	22.71
Crude protein.....	14.02	12.65	14.24

	Excrement I-1	Excrement I-2	Excrement I-3
Moisture.....	8.61	10.89	12.11
Total nitrogen.....	7.95	7.63	7.17
Uric acid nitrogen.....	4.77	4.89	4.64
Ammonia nitrogen.....	.64	.50	.56
Ether extract.....	2.94	2.71	2.44
Crude fiber.....	5.92	5.42	4.94
Nitrogen free extract.....	35.88	33.44	30.09
Uric acid.....	14.31	14.67	13.93
Ammonia.....	.77	.60	.68
Ash.....	15.64	18.26	23.47
Crude Protein.....	15.93	14.01	12.34

	Excrement I-4	Excrement I-5	Excrement J-1
Moisture.....	7.29	8.01	14.12
Total nitrogen.....	7.41	7.25	9.60
Uric acid nitrogen.....	4.42	4.33	7.06
Ammonia nitrogen.....	.44	.46	.78
Ether extract.....	3.29	3.22	3.03
Crude fiber.....	6.53	6.53	8.48
Nitrogen free extract.....	41.02	41.12	20.12
Uric acid.....	13.26	12.99	21.18
Ammonia.....	.53	.56	.94
Ash.....	12.13	12.17	21.11
Crude protein.....	15.95	15.40	11.02

EXCREMENT ANALYSIS—Continued.

	Excrement J-3	Excrement J-4	Excrement J-5
Moisture.....	15.16	16.33	12.79
Total nitrogen.....	10.00	9.21	9.76
Uric acid nitrogen.....	7.44	6.30	7.33
Ammonia nitrogen.....	.72	1.00	.67
Ether extract.....	2.83	2.75	2.83
Crude fiber.....	8.47	8.43	8.40
Nitrogen free extract.....	20.39	19.68	20.09
Uric acid.....	22.33	18.91	21.98
Ammonia.....	.88	1.22	.82
Ash.....	18.44	20.72	22.06
Crude protein.....	11.50	11.96	11.03

	Excrement J-6	Excrement K-1	Excrement K-2
Moisture.....	16.39	10.12	9.87
Total nitrogen.....	9.90	7.15	6.96
Uric acid nitrogen.....	7.22	4.68	4.56
Ammonia nitrogen.....	.72	.70	.71
Ether extract.....	2.61	9.85	10.65
Crude fiber.....	8.19	21.97	21.48
Nitrogen free extract.....	18.78	21.38	21.37
Uric acid.....	21.67	14.03	13.96
Ammonia.....	.88	.84	.86
Ash.....	19.22	10.74	11.54
Crude protein.....	12.26	11.07	10.54

	Excrement K-3	Excrement K-5	Excrement K-6
Moisture.....	9.23	14.11	14.62
Total nitrogen.....	6.93	6.62	7.10
Uric acid nitrogen.....	4.42	4.54	4.79
Ammonia nitrogen.....	.67	.64	1.00
Ether extract.....	11.55	9.29	8.00
Crude fiber.....	22.35	18.21	18.20
Nitrogen free extract.....	21.17	17.52	17.44
Uric acid.....	13.26	13.61	14.36
Ammonia.....	.82	.78	1.22
Ash.....	10.00	17.46	17.83
Crude protein.....	11.62	9.02	8.23

EXCREMENT ANALYSIS—*Continued.*

	Excrement M-1	Excrement M-2	Excrement M-3
Moisture.....	11.22	9.17	10.39
Total nitrogen.....	8.97	9.03	9.10
Uric acid nitrogen.....	6.39	6.28	6.44
Ammonia nitrogen.....	.79	.91	.86
Ether extract.....	3.45	3.63	3.33
Crude fiber.....	8.80	9.25	8.65
Nitrogen free extract.....	27.96	29.35	27.50
Uric acid.....	19.16	18.84	19.32
Ammonia.....	.96	1.10	1.04
Ash.....	17.21	17.10	18.46
Crude protein.....	11.24	11.56	11.31

	Excrement M-5	Excrement M-6	Excrement N-1
Moisture.....	11.01	8.26	9.86
Total nitrogen.....	10.03	9.09	9.58
Uric acid nitrogen.....	7.54	6.31	6.71
Ammonia nitrogen.....	.72	.80	.70
Ether extract.....	3.45	3.74	3.86
Crude fiber.....	8.79	9.79	15.79
Nitrogen free extract.....	27.96	30.55	21.98
Uric acid.....	19.62	18.93	20.12
Ammonia.....	.87	.98	.84
Ash.....	17.13	15.29	13.94
Crude protein.....	11.17	12.46	13.61

	Excrement N-3	Excrement N-4	Excrement N-6
Moisture.....	10.17	11.03	10.39
Total nitrogen.....	9.39	9.69	9.72
Uric acid nitrogen.....	6.64	7.10	7.00
Ammonia nitrogen.....	.66	.71	.75
Ether extract.....	3.51	3.52	3.52
Crude fiber.....	14.89	15.23	14.91
Nitrogen free extract.....	20.57	22.84	23.16
Uric acid.....	19.91	21.31	21.02
Ammonia.....	.80	.86	.91
Ash.....	17.04	13.48	13.76
Crude protein.....	13.11	11.73	12.33

EXCREMENT ANALYSIS—Continued.

	Excrement O-2	Excrement O-3	Excrement O-5
Moisture.....	9.81	10.12	9.32
Total nitrogen.....	6.51	6.47	6.41
Uric acid nitrogen.....	4.01	3.99	4.04
Ammonia nitrogen.....	.76	.69	.72
Ether extract.....	3.81	3.88	4.01
Crude fiber.....	12.17	12.22	11.83
Nitrogen free extract.....	37.96	37.34	39.61
Uric acid.....	12.09	11.96	12.13
Ammonia.....	.92	.83	.87
Ash.....	12.36	12.48	11.87
Crude protein.....	10.88	11.17	10.36

	Excrement P-1	Excrement P-2	Excrement P-3
Moisture.....	5.00	6.02	5.11
Total nitrogen.....	6.69	6.14	6.59
Uric acid nitrogen.....	4.79	4.05	4.27
Ether extract.....	6.94	6.59	6.89
Ammonia nitrogen.....	.59	.61	.53
Crude fiber.....	12.81	10.37	12.16
Nitrogen free extract.....	43.93	41.61	44.32
Uric acid.....	14.37	12.16	12.82
Ammonia.....	.71	.74	.64
Ash.....	8.01	13.26	6.92
Crude protein.....	8.23	9.25	11.24

	Excrement P-4	Excrement P-5	Excrement P-6
Moisture.....	6.18	7.22	6.39
Total nitrogen.....	6.24	6.09	6.00
Uric acid nitrogen.....	4.01	3.94	4.03
Ammonia nitrogen.....	.57	.66	.51
Ether extract.....	7.21	6.49	6.45
Crude fiber.....	11.86	10.91	12.33
Nitrogen free extract.....	43.62	42.13	41.83
Uric acid.....	12.03	11.82	12.09
Ammonia.....	.69	.80	.62
Ash.....	8.01	1.130	11.12
Crude protein.....	10.40	9.33	9.17

EXCREMENT ANALYSIS—Continued.

	Excrement Q-1	Excrement Q-2	Excrement Q-3
Moisture.....	15.00	14.89	14.93
Total nitrogen.....	5.90	6.07	5.96
Uric acid nitrogen.....	3.77	3.84	3.72
Ammonia nitrogen.....	.71	.81	.76
Ether extract.....	3.48	3.54	3.55
Crude fiber.....	9.61	9.75	9.77
Nitrogen free extract.....	30.80	31.38	31.11
Uric acid.....	11.31	11.53	11.16
Ammonia.....	.86	.98	.92
Ash.....	19.94	19.06	19.25
Crude protein.....	9.00	8.87	9.31

	Excrement R-1	Excrement R-2	Excrement R-3
Moisture.....	12.13	10.39	8.96
Total nitrogen.....	7.95	8.22	7.98
Uric acid nitrogen.....	4.74	4.66	4.34
Ammonia nitrogen.....	.73	.68	.60
Ether extract.....	4.60	4.59	5.81
Crude fiber.....	7.21	7.61	8.07
Nitrogen free extract.....	26.43	29.84	35.70
Uric acid.....	14.22	13.98	13.01
Ammonia.....	.89	.83	.73
Ash.....	19.02	15.72	8.67
Crude protein.....	15.50	17.05	19.05

	Excrement R-4	Excrement R-5	Excrement
Moisture.....	9.17	10.16	-----
Total nitrogen.....	7.50	7.19	-----
Uric acid nitrogen.....	4.27	4.31	-----
Ammonia nitrogen.....	.67	.59	-----
Ether extract.....	5.60	5.33	-----
Crude fiber.....	6.55	5.93	-----
Nitrogen free extract.....	39.22	38.49	-----
Uric acid.....	12.81	12.93	-----
Ammonia.....	.81	.71	-----
Ash.....	9.83	12.14	-----
Crude protein.....	16.01	14.31	-----

EXCREMENT ANALYSIS—Continued.

	Excrement S-1	Excrement S-2	Excrement S-3
Moisture.....	7.92	8.36	7.26
Total nitrogen.....	6.63	7.40	6.47
Uric acid nitrogen.....	3.71	4.05	3.68
Ammonia nitrogen.....	.64	.69	.55
Ether extract.....	3.57	3.22	3.55
Crude fiber.....	11.31	12.24	10.36
Nitrogen free extract.....	42.94	39.65	42.73
Uric acid.....	11.14	12.16	11.03
Ammonia.....	.78	.84	.67
Ash.....	8.09	10.64	10.33
Crude Protein.....	14.25	12.87	14.07

	Excrement S-4	Excrement S-5	Excrement S-6
Moisture.....	8.03	6.96	7.06
Total nitrogen.....	6.55	6.74	6.68
Uric acid nitrogen.....	3.74	4.00	3.94
Ammonia nitrogen.....	.64	.56	.61
Ether extract.....	3.19	3.56	3.45
Crude fiber.....	10.64	11.66	10.99
Nitrogen free extract.....	43.71	40.96	41.70
Uric acid.....	11.22	12.01	11.83
Ammonia.....	.77	.68	.74
Ash.....	8.84	10.49	10.92
Crude protein.....	13.60	13.68	13.31

	Excrement T-1	Excrement T-2	Excrement T-3
Moisture.....	10.31	12.02	10.86
Total nitrogen.....	5.38	5.42	5.24
Uric acid nitrogen.....	3.41	3.40	3.30
Ammonia nitrogen.....	.77	.81	.63
Ether extract.....	2.51	2.46	2.59
Crude fiber.....	14.92	14.21	15.14
Nitrogen free extract.....	32.14	31.29	33.95
Uric acid.....	10.23	10.19	9.89
Ammonia.....	.94	.98	.77
Ash.....	21.13	21.25	19.38
Crude protein.....	7.55	7.60	8.19

EXCREMENT ANALYSIS—Continued.

	Excrement T-4	Excrement T-5	Excrement U-1
Moisture.....	11.12	10.99	8.91
Total nitrogen.....	5.23	5.33	6.60
Uric acid nitrogen.....	3.29	3.30	3.94
Ammonia nitrogen.....	.66	.73	.80
Ether extract.....	2.49	2.56	3.45
Crude fiber.....	14.71	14.92	11.98
Nitrogen free extract.....	34.44	34.17	37.56
Uric acid.....	9.86	9.91	11.83
Ammonia.....	.80	.89	.97
Ash.....	18.53	18.45	13.63
Crude protein.....	8.05	8.11	11.67

	Excrement U-2	Excrement U-3	Excrement U-4
Moisture.....	7.93	8.62	9.33
Total nitrogen.....	6.47	6.25	6.27
Uric acid nitrogen.....	3.98	3.67	3.94
Ammonia nitrogen.....	.69	.78	.59
Ether extract.....	1.94	3.63	3.62
Crude fiber.....	11.75	11.36	11.17
Nitrogen free extract.....	39.75	39.94	40.33
Uric acid.....	11.90	11.02	11.82
Ammonia.....	.84	.95	.71
Ash.....	14.64	13.22	12.13
Crude protein.....	11.25	11.26	10.89

	Excrement U-5	Excrement V-1	Excrement V-2
Moisture.....	8.32	8.23	9.01
Total nitrogen.....	6.47	6.29	6.27
Uric acid nitrogen.....	3.97	4.00	3.92
Ammonia nitrogen.....	.61	.65	.73
Ether extract.....	3.63	3.70	3.59
Crude fiber.....	12.20	13.32	12.50
Nitrogen free extract.....	40.18	38.55	38.19
Uric acid.....	11.91	11.99	11.96
Ammonia.....	.74	.79	.89
Ash.....	11.26	13.15	13.90
Crude protein.....	11.76	10.27	10.16

EXCREMENT ANALYSIS—Continued.

	Excrement W-1	Excrement W-2	Excrement W-3
Moisture.....	6.93	7.06	6.89
Total nitrogen.....	6.41	6.51	6.46
Uric acid nitrogen.....	4.35	4.39	4.42
Ammonia nitrogen.....	.52	.63	.48
Ether extract.....	3.79	3.53	3.52
Crude fiber.....	14.17	14.33	14.56
Nitrogen free extract.....	42.29	40.94	41.67
Uric acid.....	12.06	13.16	13.27
Ammonia.....	.63	.77	.58
Ash.....	9.47	10.80	9.66
Crude protein.....	9.66	9.41	9.85

DIGESTIVE COEFFICIENTS

CHICKEN A-1

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter.....	82.86	47.56	35.30	42.60
Crude protein.....	14.33	7.26	7.07	49.33
Ether extract.....	3.94	1.99	1.95	49.49
Crude fiber.....	6.00	5.45	0.55	9.10
Nitrogen free extract.....	58.59	32.86	25.73	43.91

CHICKEN A-2

Organic matter.....	82.86	47.74	35.12	42.38
Crude protein.....	14.33	7.77	6.56	45.89
Ether extract.....	3.94	1.89	2.05	52.03
Crude fiber.....	6.00	5.34	0.66	11.01
Nitrogen free extract.....	58.59	32.74	25.85	44.12

CHICKEN A-3

Organic matter.....	75.95	43.28	32.67	43.01
Crude protein.....	13.13	7.15	5.98	45.54
Ether extract.....	3.61	1.70	1.91	52.91
Crude fiber.....	5.50	5.01	0.49	8.97
Nitrogen free extract.....	53.71	29.42	24.29	45.22

CHICKEN A-4

Organic matter.....	90.63	49.20	41.43	45.70
Crude protein.....	15.67	9.60	6.07	38.73
Ether extract.....	4.31	1.93	2.38	52.22
Crude fiber.....	6.56	6.02	0.54	8.16
Nitrogen free extract.....	64.09	31.65	32.44	56.01

CHICKEN A-5

Organic matter.....	98.40	50.06	48.34	49.12
Crude protein.....	17.02	9.40	7.62	44.77
Ether extract.....	4.68	2.37	2.31	49.35
Crude fiber.....	7.12	6.55	0.57	7.99
Nitrogen free extract.....	69.58	31.74	37.84	54.38

CHICKEN A-6

Organic matter.....	98.40	53.94	44.46	45.19
Crude protein.....	17.02	9.48	7.54	44.59
Ether extract.....	4.68	2.53	2.15	45.94
Crude fiber.....	7.12	6.41	.71	10.00
Nitrogen free extract.....	69.58	35.52	34.06	48.91

DIGESTIVE COEFFICIENTS—Continued.

CHICKEN A-7

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter.....	207.18	102.79	104.39	50.38
Crude protein.....	35.83	14.48	21.35	59.92
Ether extract.....	9.86	4.32	5.54	56.91
Crude fiber.....	15.00	13.78	1.22	8.19
Nitrogen free extract.....	146.49	70.21	76.28	52.07

CHICKEN A-8

Organic matter.....	207.18	100.43	106.75	51.52
Crude protein.....	35.83	13.36	22.47	62.71
Ether extract.....	9.86	4.03	5.83	59.12
Crude fiber.....	15.00	13.80	1.20	8.00
Nitrogen free extract.....	146.49	69.24	77.25	52.73

CHICKEN A-9

Organic matter.....	177.01	90.75	86.26	49.85
Crude protein.....	30.65	12.61	18.04	58.89
Ether extract.....	8.42	3.71	4.71	55.92
Crude fiber.....	12.81	11.64	1.17	9.13
Nitrogen free extract.....	125.13	62.79	62.34	49.82

TOTALS AND AVERAGES OF CHICKENS A-1, -2, -3, -4, -5, -6, -7, -8, and -9

	Total grams Intake	Total grams Outgo	Total grams Assimilated	Coefficient
Organic matter.....	1120.47	585.75	534.72	47.72
Crude protein.....	193.81	91.11	102.70	52.91
Ether extract.....	53.30	24.47	28.83	54.09
Crude fiber.....	81.11	74.00	7.11	8.76
Nitrogen free extract.....	792.25	396.17	396.08	49.99

CHICKEN B-1

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter.....	140.96	21.48	119.48	84.76
Crude protein.....	16.48	4.58	11.90	72.20
Ether extract.....	8.16	1.21	6.95	85.17
Crude fiber.....	4.16	3.93	0.23	5.62
Nitrogen free extract.....	112.16	11.76	100.40	89.51

DIGESTIVE COEFFICIENTS—*Continued.*

CHICKEN B-2

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter.....	140.96	22.72	118.24	83.88
Crude protein.....	16.48	5.45	11.01	66.49
Ether extract.....	8.16	1.63	6.53	80.02
Crude fiber.....	4.16	3.91	0.25	6.12
Nitrogen free extract.....	112.16	11.73	100.43	89.54

CHICKEN B-3*

Organic matter.....	70.48	13.73	56.75	80.52
Crude protein.....	8.24	3.08	5.16	62.63
Ether extract.....	4.03	1.03	3.05	74.75
Crude fiber.....	2.08	1.97	0.11	5.37
Nitrogen free extract.....	6.08	7.65	48.43	86.62

* Only two days completed on digestion period—went off feed.

CHICKEN B-4

Organic matter.....	140.96	21.53	119.43	84.01
Crude protein.....	16.48	5.49	10.99	66.08
Ether extract.....	8.16	2.50	5.66	69.36
Nitrogen free extract.....	112.16	9.64	102.52	91.55
Crude fiber.....	4.16	3.90	0.26	6.31

CHICKEN B-6

Organic matter.....	138.54	22.15	116.39	84.01
Crude protein.....	16.96	4.51	11.45	71.74
Ether extract.....	7.90	2.58	5.32	67.00
Crude fiber.....	4.03	3.79	0.24	5.98
Nitrogen free extract.....	110.65	11.27	99.38	89.81

TOTALS AND AVERAGES OF CHICKENS B-1, -2, -3, -4, and -6

	Total grams Intake	Total grams Outgo	Total grams Assimilated	Coefficient
Organic matter.....	631.90	101.61	530.29	83.91
Crude protein.....	73.64	23.11	50.53	68.71
Ether extract.....	36.46	8.95	27.51	75.26
Crude fiber.....	18.59	17.50	1.09	5.86
Nitrogen free extract.....	503.21	52.05	451.16	89.40

DIGESTIVE COEFFICIENTS—Continued.

CHICKEN C-2

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter.....	132.10	28.07	104.03	78.71
Crude protein.....	18.75	6.96	11.79	62.88
Ether extract.....	4.35	3.03	1.22	28.27
Crude fiber.....	4.90	4.88	0.02	0.40
Nitrogen free extract.....	104.10	13.18	90.92	87.33

CHICKEN C-1

Organic matter.....	140.64	26.96	112.40	79.92
Crude protein.....	20.00	7.48	12.52	62.10
Ether extract.....	4.64	2.20	2.44	52.58
Crude fiber.....	4.96	4.22	.74	15.14
Nitrogen free extract.....	111.04	12.86	98.18	88.41

CHICKEN C-3

Organic matter.....	140.64	33.45	107.17	76.20
Crude protein.....	20.00	7.75	12.25	61.12
Ether extract.....	4.64	3.47	1.17	25.21
Crude fiber.....	4.96	4.33	0.63	12.17
Nitrogen free extract.....	111.04	17.90	93.14	83.88

CHICKEN C-4

Organic matter.....	127.80	28.35	99.34	77.66
Crude protein.....	18.12	6.98	11.14	61.47
Ether extract.....	4.20	2.20	2.00	47.61
Crude fiber.....	4.85	4.61	0.24	4.94
Nitrogen free extract.....	100.63	14.56	86.07	85.43

CHICKEN C-5

Organic matter.....	140.64	27.33	113.39	80.55
Crude protein.....	20.00	7.50	12.50	62.50
Ether extract.....	4.64	2.56	2.08	44.87
Crude fiber.....	4.96	4.77	0.19	3.83
Nitrogen free extract.....	114.04	12.50	98.54	88.84

CHICKEN C-6

Organic matter.....	140.64	30.80	109.65	77.96
Crude protein.....	20.00	7.97	12.03	60.15
Ether extract.....	4.64	3.30	1.30	28.01
Crude fiber.....	4.96	4.90	0.06	1.41
Nitrogen free extract.....	111.04	14.63	96.41	86.82

DIGESTIVE COEFFICIENTS—*Continued.*

TOTALS AND AVERAGES OF CHICKENS C-1, -2, -3, -4, -5, and -6

	Total grams Intake	Total grams Outgo	Total grams Assimilated	Coefficient
Organic matter.....	822.46	174.74	647.72	78.50
Crude protein.....	116.87	44.64	72.23	61.70
Ether extract.....	27.11	16.76	10.35	37.76
Crude fiber.....	29.59	27.71	1.88	5.40
Nitrogen free extract.....	648.89	85.03	563.26	86.78

CHICKEN D-7

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter.....	206.06	78.66	127.40	61.82
Crude protein.....	27.88	8.46	19.42	69.69
Ether extract.....	7.24	2.14	5.10	70.44
Crude fiber.....	28.99	23.26	5.73	19.76
Nitrogen free extract.....	141.93	44.80	97.13	68.43

CHICKEN D-8

Organic matter.....	206.06	72.22	133.84	64.94
Crude protein.....	27.88	8.70	19.18	68.79
Ether extract.....	7.24	1.80	5.44	75.13
Crude fiber.....	28.99	25.16	3.83	13.21
Nitrogen free extract.....	141.93	36.56	105.37	74.24

CHICKEN D-9

Organic matter.....	206.06	70.75	135.28	65.65
Crude protein.....	27.88	7.20	20.68	74.17
Ether extract.....	7.24	1.70	5.54	76.51
Crude fiber.....	28.99	26.97	2.01	6.93
Nitrogen free extract.....	141.93	34.88	107.05	75.43

CHICKEN D-10

Organic matter.....	206.06	73.65	132.39	64.73
Crude protein.....	27.88	6.20	21.68	77.79
Ether extract.....	7.24	1.72	5.52	76.24
Crude fiber.....	28.99	25.20	3.79	13.07
Nitrogen free extract.....	141.93	40.53	101.40	71.44

DIGESTIVE COEFFICIENTS—*Continued.*

CHICKEN D-11

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter	206.06	72.85	127.21	61.73
Crude protein	27.88	6.93	20.95	75.14
Ether extract	7.24	1.83	5.41	74.72
Crude fiber	28.99	26.84	2.15	7.41
Nitrogen free extract	141.93	43.25	98.68	69.52

CHICKEN D-12

Organic matter	206.06	74.65	131.41	63.82
Crude protein	27.88	6.87	21.01	75.35
Ether extract	7.24	1.93	5.31	73.48
Crude fiber	28.99	26.15	2.84	9.79
Nitrogen free extract	141.93	39.70	102.23	72.02

TOTAL AND AVERAGES OF CHICKENS D-7, -8, -9, 10, -11, and -12

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter	1236.36	448.78	787.53	63.78
Crude protein	167.28	44.36	122.92	73.49
Ether extract	43.44	11.12	32.32	74.42
Crude fiber	173.94	153.58	20.36	11.69
Nitrogen free extract	851.58	239.72	611.86	88.18

CHICKEN E-2

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter	218.38	36.49	181.89	83.29
Crude protein	25.75	6.71	19.04	73.94
Ether extract	14.40	1.82	12.58	87.43
Crude fiber	4.56	4.47	0.09	1.97
Nitrogen free extract	173.65	23.49	150.16	86.47

CHICKEN E-3

Organic matter	218.38	34.78	183.60	84.07
Crude protein	25.75	7.10	18.65	72.42
Ether extract	14.40	2.00	12.40	86.16
Crude fiber	4.56	4.37	0.19	4.16
Nitrogen free extract	173.65	21.31	152.34	87.72

DIGESTIVE COEFFICIENTS—*Continued.*

CHICKEN E-5

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter	218.38	29.13	189.25	86.65
Crude protein	25.75	6.62	19.13	74.29
Ether extract	14.40	2.03	12.37	85.96
Crude fiber	4.56	3.94	0.62	13.59
Nitrogen free extract	173.65	16.54	157.11	90.47

CHICKEN E-8

Organic matter	202.11	32.27	169.84	84.03
Crude protein	23.83	5.70	18.13	76.08
Ether extract	13.33	1.75	11.58	86.93
Crude fiber	4.22	4.05	0.17	4.02
Nitrogen free extract	160.71	20.77	139.94	87.07

CHICKEN E-11

Organic matter	205.53	30.03	175.50	85.34
Crude protein	24.24	6.43	17.81	73.47
Ether extract	13.56	2.06	11.50	84.86
Nitrogen free extract	163.44	17.66	145.78	89.19

TOTAL AND AVERAGES OF CHICKENS E-2, -3, -5, -8, and -11

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter	1062.78	162.70	900.08	84.67
Crude protein	125.32	32.56	92.76	74.04
Ether extract	70.09	9.66	60.43	86.26
Crude fiber	22.19	20.71	1.48	6.66
Nitrogen free extract	845.10	99.77	745.33	88.18

CHICKEN F-1. RATION: CORN MEAL 2-3, MEAT SCRAP AND BONE MEAL 1-3.

	Gr. Corn meal Intake	Gr. Meat Scrap Intake	Total Intake	Total Outgo	Total Assimilation	Gr. Corn meal Digested	Gr. Meat Scrap Digested	Coefficient Meat Scraps
Organic matter-----	137.02	52.36	189.38	27.91	161.47	116.01	45.46	86.82
Crude protein-----	16.16	30.44	46.60	6.68	39.92	11.96	27.96	91.86
Ether extract-----	9.04	11.10	20.14	1.88	18.26	7.79	10.47	94.31
Crude fiber-----	2.86	1.64	4.50	4.25	0.25	0.19	0.06	3.46
Nitrogen free extract-----	108.96	9.17	118.13	15.08	103.05	96.08	6.97	76.00

CHICKEN F-5.

Organic matter-----	137.02	52.36	189.38	27.91	161.47	116.01	45.46	86.82
Crude protein-----	16.16	30.44	46.60	6.49	40.11	11.96	28.15	92.49
Ether extract-----	9.04	11.10	20.14	2.15	17.99	7.79	10.20	91.96
Crude fiber-----	2.86	1.64	4.50	4.26	0.239	0.19	0.049	3.01
Nitrogen free extract-----	108.96	9.17	118.13	14.98	103.15	96.08	7.07	77.13

TOTAL AND AVERAGES OF CHICKENS F-1 AND F-5.
BEEF SCRAP AND BONE MEAL ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter-----	104.72	13.80	90.92	86.82
Crude protein-----	60.88	4.77	56.11	92.17
Ether extract-----	22.20	1.53	20.67	93.13
Crude fiber-----	3.28	3.171	0.109	3.23
Nitrogen free extract-----	18.34	4.30	14.04	76.56

CHICKEN G-1 RATION: CORN MEAL 80%, TANKAGE 20%.

	Gr. Corn meal Intake	Gr. Tankage Intake	Total Intake	Total Outgo	Total Assimilation	Gr. Corn meal Digested	Gr. Tankage Digested	Coefficient Tankage
Organic matter.....	164.42	38.20	202.62	30.75	171.87	139.21	32.66	85.49
Crude protein.....	19.39	27.93	47.32	7.79	39.56	14.36	25.20	90.26
Ether extract.....	10.84	6.77	17.61	1.96	15.65	9.35	6.30	93.17
Crude fiber	3.43	2.20	5.63	5.32	0.32	0.23	0.09	4.00
Nitrogen free extract.....	130.75	1.30	132.05	15.69	116.36	115.29	1.07	82.00

CHICKEN G-2.

Organic matter.....	143.87	33.43	177.30	26.87	150.43	121.81	28.62	85.61
Crude protein	16.96	24.44	41.40	6.58	34.82	12.55	22.27	91.14
Ether extract.....	9.49	5.92	15.41	1.89	13.52	8.18	5.34	90.28
Crude fiber	3.00	1.93	4.93	4.65	0.28	0.20	0.08	3.88
Nitrogen free extract.....	114.40	1.13	115.53	13.73	101.80	100.87	0.93	81.76

TOTAL AND AVERAGES OF CHICKENS G-1 AND -2.

TANKAGE ONLY

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter	71.63	10.35	61.28	85.50
Crude protein	52.37	4.90	47.47	90.70
Ether extract	12.69	1.05	11.64	91.71
Crude fiber	4.13	3.96	0.17	3.94
Nitrogen free extract	2.43	0.43	2.00	81.88

CHICKEN H-1. RATION: CORN MEAL 80%, BLOOD MEAL 20%.

	Gr. Corn Meal Intake	Gr. Blood Meal Intake	Total Intake	Total Outgo	Grams Assimilation	Gr. Corn Meal Digested	Gr. Blood Meal Digested	Coefficient Blood Meal
Organic matter-----	143.87	36.62	180.49	26.27	154.22	121.81	32.41	88.50
Crude protein-----	16.96	34.90	51.86	8.14	43.72	12.55	31.17	89.32
Ether extract-----	9.49	0.24	9.73	1.36	8.37	8.18	0.19	79.16
Crude fiber-----	3.00	0.00	3.00	2.80	0.20	0.20		
Nitrogen free extract-----	114.40	1.47	115.87	13.95	101.92	100.89	1.05	71.33

CHICKEN H-3.

Organic matter-----	132.32	20.92	144.24	21.66	122.58	104.41	18.17	86.85
Crude protein-----	14.54	19.94	34.48	5.75	28.73	10.76	17.97	90.17
Ether extract-----	8.13	0.14	8.27	1.16	7.11	7.01	0.11	77.31
Crude fiber-----	2.58		2.58	2.41	0.17	0.17		
Nitrogen free extract-----	98.06	.81	98.90	12.33	86.57	85.93	0.61	73.14

CHICKEN H-5.

Organic matter-----	143.87	36.62	180.49	26.88	153.61	121.81	31.80	86.83
Crude protein-----	16.96	34.90	51.86	8.73	43.13	12.55	30.55	87.63
Ether extract-----	9.49	0.24	9.73	1.38	8.37	8.18	0.19	80.45
Crude fiber-----	3.00		3.00	2.80	.20	.20		
Nitrogen free extract-----	114.40	1.47	115.87	13.96	101.91	100.88	1.03	70.18

CHICKEN H-6. RATION: CORN MEAL 80%, BLOOD MEAL 20%.

	Gr. Corn Meal Intake	Gr. Blood Meal Intake	Total Intake	Total Outgo	Grams Assimilation	Gr. Corn Meal Digested	Gr. Blood Meal Digested	Coefficient Blood Meal
Organic matter-----	143.87	36.62	180.49	27.68	152.81	121.81	31.00	84.65
Crude protein-----	16.96	34.90	51.86	9.54	42.32	12.55	29.77	85.31
Ether extract-----	9.49	0.24	9.73	1.37	8.36	8.18	0.18	76.46
Crude fiber-----	3.00		3.00	2.80	0.20	0.20		
Nitrogen free extract-----	114.40	1.47	115.87	13.94	101.93	100.88	1.05	71.56

TOTAL AND AVERAGES OF CHICKENS H-1, -3, -5, AND -6
BLOOD MEAL ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter-----	130.78	17.40	113.38	86.71
Crude protein-----	124.64	15.15	109.49	88.10
Ether extract-----	0.86	.19	.67	78.36
Nitrogen free extract-----	5.25	2.02	3.23	71.55

CHICKEN I-1. RATION: CORN MEAL 80%, DRIED BUTTERMILK 20%.

	Gr. Corn Meal Intake	Gr. Buttermilk Intake	Total Intake	Total Outgo	Grams Assimilation	Gr. Corn Meal Digested	Gr. Buttermilk Digested	Coefficient Buttermilk
Organic matter-----	164.42	40.06	204.40	32.72	171.66	139.21	32.45	81.00
Crude protein-----	19.39	16.39	35.78	8.61	27.17	14.36	12.81	78.19
Ether extract-----	10.84	0.475	11.32	1.59	9.73	9.35	.38	79.10
Crude fiber-----	3.43	-----	3.43	3.20	0.23	0.23	-----	-----
Nitrogen free extract-----	130.75	23.18	153.93	19.38	134.55	115.29	19.26	83.11

CHICKEN I-2.

Organic matter-----	164.42	40.06	204.48	32.84	171.64	139.21	32.43	80.92
Crude protein-----	19.39	16.39	35.78	8.27	27.51	14.36	13.15	80.23
Ether extract-----	10.84	0.475	11.32	1.60	9.72	9.35	0.37	77.19
Crude fiber-----	3.43	0.00	3.45	3.20	0.28	0.23	-----	-----
Nitrogen free extract-----	130.75	23.18	153.93	19.73	134.20	115.29	18.91	81.62

CHICKEN I-3.

Organic matter-----	80.84	19.69	100.53	15.94	84.59	68.45	16.14	81.98
Crude protein-----	9.53	8.06	17.59	3.95	13.64	7.06	6.58	81.67
Ether extract-----	5.33	0.234	5.56	0.78	4.78	4.59	.19	80.46
Crude fiber-----	1.69	-----	1.69	1.58	0.11	0.11	-----	-----
Nitrogen free extract-----	64.29	11.40	75.69	9.63	66.06	56.69	9.37	82.16

CHICKEN I-4. RATION: CORN MEAL 80%, DRIED BUTTERMILK 20%.

	Gr. Corn Meal Intake	Gr. Buttermilk Intake	Total Intake	Total Outgo	Grams Assimilation	Gr. Corn Meal Digested	Gr. Buttermilk Digested	Coefficient Buttermilk
Organic matter-----	164.42	40.06	204.48	32.77	171.71	139.21	32.50	80.00
Crude protein-----	19.39	16.39	35.78	7.82	27.96	14.36	13.60	83.02
Ether extract-----	10.84	0.475	11.32	1.61	9.71	9.35	0.36	76.19
Crude fiber-----	3.43	-----	3.43	3.20	.23	0.23	-----	-----
Nitrogen free extract-----	130.75	23.18	153.93	20.10	133.83	115.29	18.54	80.00

CHICKEN I-5.

Organic matter-----	164.42	40.06	204.48	32.53	171.95	139.21	32.74	80.06
Crude protein-----	19.39	16.39	35.78	7.55	28.23	14.33	13.87	84.67
Ether extract-----	10.84	0.475	11.32	1.59	9.73	9.35	.38	80.13
Crude fiber-----	3.43	-----	3.43	3.20	.23	0.23	-----	-----
Nitrogen free extract-----	130.75	23.18	153.93	20.15	133.78	115.29	18.49	78.81

TOTAL AND AVERAGES OF CHICKENS I-1, -2, -3, -4, AND 5

DRIED BUTTERMILK ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter-----	179.93	33.67	146.26	80.79
Crude protein-----	73.62	13.61	60.01	81.55
Ether extract-----	2.134	.454	1.68	78.01
Crude fiber-----	-----	-----	-----	-----
Nitrogen free extract-----	104.12	22.98	84.57	81.14

CHICKEN J-1. RATION: CORN MEAL 2-3, SOYBEAN MEAL 1-3.

	Gr. Corn Meal Intake	Gr. Soybean Meal Intake	Total Intake	Total Outgo	Total Assimilation	Gr. Corn Meal Digested	Gr. Soybean Meal Digested	Coefficient Soybean Meal
Organic matter-----	137.02	67.61	204.63	35.76	168.97	116.01	52.96	78.33
Crude protein-----	16.16	33.68	49.84	9.26	40.63	11.96	28.67	85.13
Ether extract-----	9.04	6.08	15.12	2.61	12.61	7.79	4.82	79.32
Crude fiber-----	2.86	4.56	7.42	7.13	0.29	0.19	0.10	2.16
Nitrogen free extract-----	108.96	23.30	132.26	16.81	115.45	96.08	19.37	83.16

CHICKEN J-3.

Organic matter-----	137.02	67.61	204.63	36.29	168.34	116.01	52.33	77.39
Crude protein-----	16.16	33.68	49.84	9.66	40.18	11.96	28.22	83.79
Ether extract-----	9.04	6.08	15.12	2.38	12.74	7.79	4.95	81.46
Crude fiber-----	2.86	4.56	7.42	7.12	0.30	0.19	0.11	2.48
Nitrogen free extract-----	108.96	23.30	132.26	17.13	115.13	96.08	19.05	81.78

CHICKEN J-4.

Organic matter-----	96.94	47.83	144.77	25.76	119.01	82.02	36.99	77.33
Crude protein-----	11.43	23.82	35.25	7.18	28.07	8.46	19.61	82.34
Ether extract-----	6.39	4.30	10.69	1.65	9.04	5.51	3.53	82.16
Crude fiber-----	2.03	3.23	5.26	5.06	0.20	.13	0.07	1.98
Nitrogen free extract-----	77.09	16.48	93.57	11.81	81.76	67.98	13.78	83.62

CHICKEN J-5. RATION: CORN MEAL 2-3, SOYBEAN MEAL 1-3.

	Gr. Corn Meal Intake	Gr. Soybean Meal Intake	Total Intake	Total Outgo	Total Assimilation	Gr. Corn Meal Digested	Gr. Soybean Meal Digested	Coefficient Soybean Meal
Organic matter-----	137.02	67.61	204.63	36.01	168.62	116.01	52.61	77.81
Crude protein-----	16.16	33.68	49.84	9.38	40.46	11.96	28.50	84.63
Ether extract-----	9.04	6.08	15.12	2.41	12.71	7.79	4.92	80.97
Crude fiber-----	2.86	4.56	7.42	7.14	0.28	0.10	0.09	2.00
Nitrogen free extract-----	108.96	23.30	132.26	17.08	115.18	96.08	19.10	82.00

CHICKEN J-6.

Organic matter-----	137.02	67.61	204.63	36.41	168.22	116.01	52.21	77.22
Crude protein-----	16.16	33.68	49.84	10.67	39.17	11.96	27.21	80.79
Ether extract-----	9.04	6.08	15.12	2.27	12.85	7.79	5.06	83.15
Crude fiber-----	2.86	4.56	7.42	7.13	0.29	0.19	0.10	2.19
Nitrogen free extract-----	108.96	23.30	132.26	16.34	115.92	96.08	19.84	85.17

TOTAL AND AVERAGES OF CHICKENS J-1, -3, -4, -5, AND -6.

SOYBEAN MEAL ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter-----	318.27	71.17	247.10	77.61
Crude protein-----	158.54	26.33	132.21	83.33
Ether extract-----	28.62	5.34	23.28	81.41
Crude fiber-----	21.47	21.00	0.47	2.16
Nitrogen free extract-----	109.68	26.54	91.40	83.14

CHICKEN K-1. RATION: CORN MEAL 2-3, PEANUT MEAL (FAT NOT EXTRACTED) 1-3.

	Gr. Corn Meal Intake	Gr. Peanut Meal Intake	Total Intake	Total Outgo	Total Assimilation	Gr. Corn Meal Digested	Gr. Peanut Meal Digested	Coefficient Peanut Meal
Organic matter-----	137.02	71.20	208.22	45.01	163.21	116.01	47.20	66.29
Crude protein-----	16.16	17.04	33.20	7.75	25.45	11.96	13.49	79.18
Ether extract-----	9.04	28.48	37.52	6.90	30.62	7.79	22.83	80.19
Crude fiber-----	2.86	13.28	16.14	15.38	0.76	0.19	0.57	4.36
Nitrogen free extract-----	108.96	12.40	121.36	14.97	106.39	96.08	10.31	83.16

CHICKEN K-2.

Organic matter-----	137.02	71.20	208.22	45.10	163.12	116.01	47.11	66.16
Crude protein-----	16.16	17.04	33.20	7.38	25.82	11.96	13.96	81.36
Ether extract-----	9.04	28.48	37.52	7.46	30.06	7.79	22.27	78.21
Crude fiber-----	2.86	13.28	16.14	15.29	0.85	0.19	0.66	5.00
Nitrogen free extract-----	108.96	12.40	121.36	14.96	106.40	96.08	10.32	83.28

CHICKEN K-3.

Organic matter-----	137.02	71.20	208.22	46.03	162.19	116.01	46.18	64.87
Crude protein-----	16.16	17.04	33.20	8.02	25.18	11.96	13.22	77.63
Ether extract-----	9.04	28.48	37.52	7.97	29.55	7.79	21.76	76.41
Crude fiber-----	2.86	13.28	16.14	15.42	0.72	0.19	0.53	3.99
Nitrogen free extract-----	168.96	12.40	121.36	14.61	106.75	96.08	10.67	86.12

CHICKEN K-5. RATION: CORN MEAL 2-3, PEANUT MEAL (FAT NOT EXTRACTED) 1-3.

	Gr. Corn Meal Intake	Gr. Peanut Meal Intake	Total Intake	Total Outgo	Total Assimilation	Gr. Corn Meal Digested	Gr. Peanut Meal Digested	Coefficient Peanut Meal
Organic matter-----	137.02	71.20	208.22	45.42	162.80	116.01	46.79	65.71
Crude protein-----	16.16	17.04	33.20	7.58	25.62	11.96	13.66	80.19
Ether extract-----	9.04	28.48	37.52	7.81	29.71	7.79	21.92	76.98
Crude fiber-----	2.86	13.28	16.14	15.30	0.84	0.19	0.65	4.89
Nitrogen free extract-----	108.96	12.40	121.36	14.72	106.64	96.08	10.56	85.17

CHICKEN K-6.

Organic matter-----	137.02	71.20	208.22	44.63	163.59	116.01	47.58	66.69
Crude protein-----	16.16	17.04	32.20	7.08	26.12	11.96	14.16	83.14
Ether extract-----	9.04	28.48	37.52	6.88	30.64	7.79	22.85	80.26
Crude fiber-----	2.86	13.28	16.14	15.66	0.48	0.19	0.29	2.16
Nitrogen free extract-----	108.96	12.40	121.36	15.00	106.36	96.08	10.28	82.98

TOTAL AND AVERAGES OF CHICKENS K-1, -2, -3, -5, AND -6.

PEANUT MEAL ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter-----	356.00	121.14	234.86	65.94
Crude protein-----	85.20	16.81	68.39	80.30
Ether extract-----	142.40	30.77	111.63	78.41
Crude fiber-----	66.40	63.70	2.70	4.08
Nitrogen free extract-----	62.00	9.86	52.14	84.14

CHICKEN M-1. RATION: CORN MEAL 80%, FISH MEAL 20%.

	Gr. Corn Meal Intake	Gr. Fish Meal Intake	Total grams Intake	Total grams Outgo	Total Assimilation	Gr. Corn Meal Digested	Gr. Fish Meal Digested	Coefficient
Organic matter-----	165.45	28.18	193.63	30.11	163.52	137.69	25.83	92.01
Crude protein-----	17.33	23.47	40.80	6.58	34.22	12.74	21.48	91.50
Ether extract-----	10.66	4.71	15.37	2.02	13.35	9.00	4.35	92.30
Crude fiber-----	5.52	-----	5.52	5.15	0.37	0.37	-----	-----
Nitrogen free extract-----	131.94	-----	131.94	16.36	115.58	115.58	-----	-----

CHICKEN M-2.

Organic matter-----	163.35	27.82	191.17	29.60	161.57	135.94	25.63	92.13
Crude protein-----	17.10	23.17	40.27	6.36	33.91	12.56	21.35	92.16
Ether extract-----	10.52	4.65	15.17	2.00	13.17	8.89	4.28	91.98
Crude fiber-----	5.45	-----	5.45	5.09	0.36	0.36	-----	-----
Nitrogen free extract-----	130.28	-----	130.28	16.15	114.13	114.13	-----	-----

CHICKEN M-3.

Organic matter-----	166.85	28.41	195.26	30.48	164.78	138.86	25.92	91.23
Crude protein-----	17.47	23.66	41.13	6.79	34.34	12.84	21.50	90.89
Ether extract-----	10.75	4.75	15.50	2.00	13.50	9.08	4.42	93.00
Crude fiber-----	5.57	-----	5.57	5.19	0.38	0.38	-----	-----
Nitrogen free extract-----	133.06	-----	133.06	16.50	116.56	116.56	-----	-----

CHICKEN M-5. RATION: CORN MEAL 80%. FISH MEAL 20%

	Gr. Corn Meal Intake	Gr. Fish Meal Intake	Total grams Intake	Total grams Outgo	Total Assimilation	Gr. Corn Meal Digested	Gr. Fish Meal Digested	Coefficient Fish Meal
Organic matter-----	166.85	28.41	195.26	30.37	164.89	138.86	26.03	91.62
Crude protein-----	17.47	23.66	41.13	6.59	34.54	12.84	21.70	91.73
Ether extract-----	10.75	4.75	15.50	2.09	13.41	9.08	4.33	91.14
Crude fiber-----	5.57	-----	5.57	5.19	0.38	0.38	-----	-----
Nitrogen free extract-----	133.06	-----	133.06	16.50	116.56	116.56	-----	-----

CHICKEN M-6.

Organic matter-----	166.85	28.41	195.26	30.44	164.82	138.86	25.96	91.38
Crude protein-----	17.47	23.66	41.13	6.73	34.40	12.84	21.56	91.12
Ether extract-----	10.75	4.75	15.50	2.02	13.48	9.08	4.40	92.71
Crude fiber-----	5.57	-----	5.57	5.19	0.38	0.38	-----	-----
Nitrogen free extract-----	133.06	-----	133.06	16.50	115.56	116.56	-----	-----

TOTAL AND AVERAGES OF CHICKENS M-1, -2, -3, -5, AND -6.

FISH MEAL ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter-----	141.23	11.86	129.37	91.60
Crude protein-----	117.62	10.03	107.59	91.48
Ether extract-----	23.61	1.86	21.75	92.24
Crude fiber-----	-----	-----	-----	-----
Nitrogen free extract-----	-----	-----	-----	-----

CHICKEN N-1. RATION: CORN MEAL 2-3. COTTONSEED MEAL 1-3.

	Gr. Corn Meal Intake	Gr. Cottonseed Meal Intake	Total Intake grams	Total Outgo grams	Total Assimilation grams	Gr. Corn Meal Digested	Gr. Cottonseed Meal Digested	Coefficient Cottonseed Meal
Organic matter -----	139.04	67.84	206.88	42.41	164.47	115.71	48.76	71.87
Crude protein -----	14.56	32.24	46.80	9.94	36.86	10.70	26.16	81.13
Ether extract -----	8.96	6.48	15.44	2.82	12.62	7.57	5.05	78.00
Crude fiber -----	4.64	7.68	12.32	11.53	0.79	0.31	0.48	6.31
Nitrogen free extract -----	110.88	21.44	132.32	18.12	114.20	97.13	17.07	79.61

CHICKEN N-3.

Organic matter -----	139.04	67.84	206.88	40.64	166.24	115.71	50.53	74.48
Crude protein -----	14.56	32.24	46.80	10.23	36.57	10.70	25.87	80.23
Ether extract -----	8.96	6.48	15.44	2.74	12.70	7.57	5.13	70.18
Crude fiber -----	4.64	7.68	12.32	11.62	0.70	0.31	0.39	5.13
Nitrogen free extract -----	110.88	21.44	132.32	16.05	116.27	97.13	19.14	89.27

CHICKEN N-4.

Organic matter -----	139.04	67.84	206.88	40.54	116.34	115.71	50.63	74.63
Crude protein -----	14.56	32.24	46.80	8.92	37.88	10.70	27.18	84.29
Ether extract -----	8.96	6.48	15.44	2.68	12.76	7.57	5.19	80.11
Crude fiber -----	4.64	7.68	12.32	11.58	0.74	0.31	0.43	5.63
Nitrogen free extract -----	110.80	21.44	132.32	17.36	114.96	97.13	17.83	83.18

CHICKEN N-6. RATION: CORN MEAL 2-3. COTTONSEED MEAL 1-3.

	Gr. Corn Meal Intake	Gr. Cottonseed Meal Intake	Total Intake grams	Total Outgo grams	Total Assimilation grams	Gr. Corn Meal Digested	Gr. Cottonseed Meal Digested	Coefficient Cottonseed Meal
Organic matter-----	139.04	67.84	206.88	42.04	164.81	115.71	49.10	72.22
Crude protein-----	14.56	32.24	46.80	9.62	37.18	10.70	26.48	82.14
Ether extract-----	8.96	6.48	15.44	2.75	12.69	7.57	5.12	78.96
Crude fiber-----	4.64	7.68	12.32	11.63	0.69	0.31	0.38	4.98
Nitrogen free extract-----	110.88	21.44	132.32	18.07	114.25	97.13	17.12	79.84

TOTAL AND AVERAGES OF CHICKENS N-1, -3, -4, AND 6.

COTTONSEED MEAL ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter-----	271.36	72.34	199.02	73.32
Crude protein-----	128.96	23.27	105.69	81.94
Ether extract-----	25.92	5.43	20.49	79.05
Crude fiber-----	30.72	29.04	1.68	5.46
Nitrogen free extract-----	85.76	14.60	71.16	82.92

CHICKEN O-2

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter	208.56	34.33	174.21	83.53
Crude protein	21.84	5.77	16.07	73.60
Ether extract	13.44	1.99	11.45	85.20
Crude fiber	6.96	6.45	0.49	7.00
Nitrogen free extract	166.32	20.12	146.20	87.90

CHICKEN O-3

Organic matter	208.56	34.25	174.31	83.50
Crude protein	21.84	5.92	15.92	72.90
Ether extract	13.44	2.06	11.38	84.70
Crude fiber	6.96	6.48	0.48	6.90
Nitrogen free extract	166.32	19.79	146.53	88.10

CHICKEN O-5

Organic matter	208.56	36.21	172.35	82.60
Crude protein	21.84	5.70	16.14	73.90
Ether extract	13.44	2.21	11.23	83.60
Crude fiber	6.96	6.51	0.45	6.50
Nitrogen free extract	166.32	21.79	144.53	86.99

TOTALS AND AVERAGES OF CHICKENS O-2, -3, AND -5.

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter	625.68	104.79	520.87	83.21
Crude protein	65.52	17.39	48.13	73.50
Ether extract	40.32	6.26	34.06	84.50
Crude fiber	20.88	19.44	1.44	6.80
Nitrogen free extract	498.96	61.70	437.26	87.60

CHICKEN P-1

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter	207.36	88.66	118.70	57.24
Crude protein	40.56	8.40	32.16	79.28
Ether extract	12.24	7.08	5.16	42.16
Crude fiber	20.40	18.17	2.23	11.12
Nitrogen free extract	134.16	55.01	79.15	59.00

CHICKEN P-2

	Intake grams	Outgo grams	Assimilation grams	Coefficient grams
Organic matter	207.36	93.06	114.30	55.12
Crude protein	40.56	10.08	30.48	75.15
Ether extract	12.24	7.19	5.05	41.26
Crude fiber	20.40	18.36	2.04	10.01
Nitrogen free extract	134.16	57.43	76.73	57.19

CHICKEN P-3

Organic matter	207.36	92.85	114.51	55.22
Crude protein	40.56	11.36	29.20	71.98
Ether extract	12.24	6.96	5.28	43.16
Crude fiber	20.40	18.33	2.07	10.18
Nitrogen free extract	134.16	56.20	77.96	58.11

CHICKEN P-4

Organic matter	207.36	84.20	123.16	59.39
Crude protein	40.56	9.68	30.88	76.13
Ether extract	12.24	6.71	5.53	45.19
Crude fiber	20.40	18.33	2.07	10.14
Nitrogen free extract	134.16	49.48	84.68	63.12

CHICKEN P-5

Organic matter	207.36	92.94	114.42	55.17
Crude protein	40.56	10.17	30.39	74.94
Ether extract	12.24	7.08	5.16	42.16
Crude fiber	20.40	18.38	2.02	9.89
Nitrogen free extract	134.16	57.31	76.85	57.28

CHICKEN P-6

Organic matter	207.36	93.34	114.02	55.22
Crude protein	40.56	10.09	30.47	95.12
Ether extract	12.24	7.10	5.14	41.98
Crude fiber	20.40	18.34	2.06	10.09
Nitrogen free extract	134.16	57.71	76.35	56.91

TOTALS AND AVERAGES OF CHICKENS P-1, -2, -3, -4, -5, AND 6.

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter	1244.16	545.05	699.11	56.19
Crude protein	243.36	59.78	183.58	75.43
Ether extract	73.44	42.12	31.32	42.64
Crude fiber	122.40	109.91	12.49	10.20
Nitrogen free extract	804.96	333.14	471.72	58.61

CHICKEN Q-1. RATION: CORN MEAL ¾, RYE ¼.

	Gr. Corn meal Intake	Grams Rye Intake	Total grams Intake	Total grams Outgo	Total Assimilation	Gr. Corn meal Digested	Grams Rye Digested	Coefficient Rye
Organic matter -----	136.87	45.92	182.79	32.70	150.09	113.90	36.19	78.81
Crude protein -----	14.33	6.24	20.57	5.58	14.99	10.53	4.46	71.49
Ether extract -----	8.82	1.10	9.92	2.16	7.76	7.45	0.31	27.84
Crude fiber -----	4.57	1.78	6.35	5.96	0.39	0.31	0.08	4.61
Nitrogen free extract -----	109.15	36.80	145.95	19.00	126.95	95.61	31.34	85.16

CHICKEN Q-2.

Organic matter -----	136.87	45.92	182.79	32.98	149.81	113.90	35.91	78.20
Crude protein -----	14.33	6.24	20.57	5.41	15.16	10.53	4.63	74.12
Ether extract -----	8.82	1.10	9.92	2.16	7.76	7.45	.31	28.19
Crude fiber -----	4.57	1.78	6.35	5.95	0.40	0.31	.09	5.00
Nitrogen free extract -----	109.15	36.80	145.95	19.46	126.49	95.61	30.88	83.91

CHICKEN Q-3.

Organic matter -----	136.87	45.92	182.79	34.10	143.78	118.90	34.88	75.74
Crude protein -----	14.36	6.24	20.57	5.68	14.89	10.53	4.36	69.86
Ether extract -----	8.82	1.10	9.92	2.17	7.75	7.45	0.30	27.14
Crude fiber -----	4.57	1.78	6.35	5.96	0.39	0.31	0.08	4.38
Nitrogen free extract -----	109.15	36.80	145.95	20.20	125.75	95.61	30.14	81.89

TOTALS AND AVERAGES OF CHICKENS Q-1, -2, AND -3.
Rye Only

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter	137.76	30.87	106.93	77.65
Crude protein	18.72	5.27	13.45	71.85
Ether extract	3.30	2.38	0.92	27.87
Crude fiber	5.34	5.09	0.25	4.68
Nitrogen free extract	110.40	18.04	92.36	83.65

CHICKEN R-1

	Intake grams	Outgo grams	Assimilation grams	Coefficient
Organic matter	212.88	32.25	180.63	84.84
Crude protein	33.36	9.30	24.06	72.12
Ether extract	20.88	2.76	18.12	86.76
Crude fiber	4.56	4.33	0.23	5.15
Nitrogen free extract	154.08	15.86	138.22	89.71

CHICKEN R-2

Organic matter	212.88	33.68	179.20	84.13
Crude protein	33.36	9.72	23.64	70.85
Ether extract	20.88	2.61	18.27	87.49
Crude fiber	4.56	4.34	0.22	4.98
Nitrogen free extract	154.08	17.01	137.07	88.96

CHICKEN R-3

Organic matter	212.88	37.07	175.81	82.06
Crude protein	33.36	10.29	23.07	69.14
Ether extract	20.88	3.14	17.74	84.98
Crude fiber	4.56	4.36	0.20	4.37
Nitrogen free extract	154.08	19.28	134.80	87.49

CHICKEN R-4

Organic matter	212.88	44.48	168.40	79.11
Crude protein	33.36	10.57	22.79	68.31
Ether extract	20.88	3.70	17.18	82.26
Crude fiber	4.56	4.32	0.24	5.17
Nitrogen free extract	154.08	25.89	128.19	83.19

CHICKEN R-5

Organic matter	212.88	46.76	166.12	78.45
Crude protein	33.36	10.44	22.92	68.71
Ether extract	20.88	3.89	16.99	81.39
Crude fiber	4.56	4.33	0.23	4.98
Nitrogen free extract	154.08	23.10	125.98	81.76

TOTALS AND AVERAGES OF CHICKENS R-1, -2, -3, -4, AND -5.

	Total Intake grams	Total Outgo gram	Total Assimilation grams	Coefficient
Organic matter	1064.40	194.24	870.16	81.75
Crude protein	166.80	50.32	116.48	69.83
Ether extract	104.40	16.10	88.30	84.57
Crude fiber	22.80	21.68	1.12	4.91
Nitrogen free extract	770.40	106.14	664.26	86.22

CHICKEN S-1. RATION: CORN MEAL ¾, BUCKWHEAT ¼

	Gr. Corn meal Intake	Gr. Buckwheat Intake	Total grams Intake	Total grams Outgo	Total Assimilation	Gr. Corn meal Digested	Gr. Buckwheat Digested	Coefficient Buckwheat
Organic matter-----	156.42	51.96	208.38	40.84	167.54	130.16	37.38	71.93
Crude protein-----	16.38	6.66	23.04	7.27	15.77	13.03	3.74	56.18
Ether extract-----	10.03	1.80	11.88	1.82	10.06	8.51	1.55	86.23
Crude fiber-----	5.22	5.34	10.56	9.85	.71	0.35	0.36	6.76
Nitrogen free extract-----	124.74	38.16	162.90	21.90	141.00	109.27	31.73	83.16

CHICKEN S-2.

Organic matter-----	156.42	51.96	208.38	41.70	166.68	130.16	36.52	70.28
Crude protein-----	16.38	6.66	23.04	7.34	15.70	12.03	3.67	55.14
Ether extract-----	10.08	1.80	11.88	1.84	10.04	8.51	1.53	84.98
Crude fiber-----	5.22	5.34	10.56	9.83	0.73	0.73	0.38	7.11
Nitrogen free extract-----	124.74	38.16	162.90	22.69	140.21	109.27	30.94	81.07

CHICKEN S-3.

Organic matter-----	156.42	51.96	208.38	41.76	166.62	130.16	36.46	70.15
Crude protein-----	16.38	6.66	23.04	7.32	15.72	12.03	3.69	55.46
Ether extract-----	10.08	1.80	11.88	1.85	10.03	8.51	1.52	84.19
Crude fiber-----	5.22	5.34	10.56	9.85	0.71	0.35	0.36	6.71
Nitrogen free extract-----	124.74	38.16	162.90	22.74	140.16	109.27	30.89	80.96

CHICKEN S-4. RATION: CORN MEAL $\frac{3}{4}$, BUCKWHEAT $\frac{1}{4}$.

	Gr. Corn Meal Intake	Gr. Buckwheat Intake	Total grams Intake	Total grams Outgo	Total Assimilation	Gr. Corn Meal Digested	Gr. Buckwheat Digested	Coefficient Buckwheat
Organic matter -----	156.42	51.96	208.38	42.14	166.24	130.16	36.08	69.63
Crude protein -----	16.38	6.66	23.04	7.21	15.83	12.03	3.80	57.13
Ether extract -----	10.08	1.80	11.88	1.88	10.00	8.51	1.49	82.98
Crude fiber -----	5.22	5.34	10.56	9.88	0.68	0.35	0.33	6.12
Nitrogen free extract -----	124.74	38.16	162.90	23.17	139.73	109.27	30.46	79.81

CHICKEN S-5.

Organic matter -----	156.42	51.96	208.38	41.33	167.05	130.16	36.89	70.99
Crude protein -----	16.38	6.66	23.04	7.25	15.79	12.03	3.76	56.39
Ether extract -----	10.08	1.80	11.88	1.89	9.99	8.51	1.48	82.16
Crude fiber -----	5.22	5.34	10.56	9.89	0.67	0.35	0.32	5.98
Nitrogen free extract -----	124.74	38.16	162.90	22.30	140.60	109.27	31.33	82.09

CHICKEN S-6.

Organic matter -----	156.42	51.96	208.38	42.09	166.29	130.16	36.13	69.50
Crude protein -----	16.38	6.66	23.04	7.32	15.72	12.03	3.69	55.38
Ether extract -----	10.08	1.80	11.88	1.90	9.98	8.51	1.47	81.49
Crude fiber -----	5.22	5.34	10.56	9.93	0.63	0.35	0.28	5.13
Nitrogen free extract -----	124.74	38.16	162.90	22.94	139.96	108.27	30.69	80.42

TOTALS AND AVERAGES OF CHICKENS S-1, -2, -3, -4, -5, AND -6.

BUCKWHEAT ONLY

	Total Intake grams	Total Outgo grams	Total Assimilated grams	Coefficient
Organic matter	311.76	92.30	219.46	70.39
Crude protein	39.96	17.61	22.35	55.93
Ether extract	10.80	1.76	9.04	83.73
Crude fiber	32.04	30.01	2.03	6.33
Nitrogen free extract	238.96	42.72	186.04	81.25

CHICKEN T-1. RATION: CORN MEAL ¾, RICE ¼.

	Gr. Corn Meal Intake	Gr. Rice Intake	Total grams Intake	Total grams Outgo	Total grams Assimilated	Gr. Corn Meal Digested	Gr. Rice Digested	Coefficient Rice
Organic matter -----	136.87	45.04	181.91	35.52	146.39	113.90	32.49	72.11
Crude protein -----	14.33	4.25	18.58	4.68	13.90	10.53	3.37	79.36
Ether extract -----	8.82	1.05	9.87	1.56	8.31	7.45	0.86	81.60
Crude fiber -----	4.57	5.30	9.87	9.25	0.62	0.31	0.31	5.78
Nitrogen free extract -----	108.15	34.44	143.59	20.03	123.56	95.61	27.95	81.16

CHICKEN T-2.

Organic matter -----	136.87	45.04	181.91	36.12	145.79	113.90	31.89	70.80
Crude protein -----	14.33	4.25	18.58	4.94	13.64	10.53	3.11	73.18
Ether extract -----	8.82	1.05	9.87	1.60	8.27	7.45	0.82	78.47
Crude fiber -----	4.57	5.30	9.87	9.24	0.63	0.31	0.32	6.13
Nitrogen free extract -----	109.15	34.44	143.59	20.34	123.25	95.61	27.64	80.27

CHICKEN T-3.

Organic matter -----	136.87	45.04	181.91	36.54	145.37	113.90	31.47	69.87
Crude protein -----	14.33	4.25	15.58	5.00	13.58	10.53	3.05	71.69
Ether extract -----	8.82	1.05	9.87	1.58	8.29	7.45	0.84	80.17
Crude fiber -----	4.57	5.30	9.87	9.25	0.62	0.31	0.31	5.96
Nitrogen free extract -----	109.15	34.44	143.59	20.71	122.88	95.61	27.27	79.18

CHICKEN T-4. RATION: CORN MEAL ¾, RICE ¼.

	Gr. Corn meal Intake	Gr. Rice Intake	Total grams Intake	Total grams Outgo	Total grams Assimilated	Gr. Corn meal Digested	Gr. Rice Digested	Coefficient Rice
Organic matter -----	136.87	45.04	178.91	37.61	144.30	113.90	30.40	67.40
Crude protein -----	14.33	4.25	18.58	5.07	13.51	10.53	2.98	70.09
Ether extract -----	8.82	1.05	9.87	1.57	8.30	7.45	0.85	80.96
Crude fiber -----	4.57	5.30	9.87	9.27	0.60	0.31	0.29	5.49
Nitrogen free extract -----	109.15	34.44	143.59	21.70	121.89	95.61	26.28	76.31

CHICKEN T-5.

Organic matter -----	136.87	45.04	181.91	37.06	144.85	113.90	30.95	68.71
Crude protein -----	14.33	4.25	18.58	5.03	13.55	10.53	3.02	71.01
Ether extract -----	8.82	1.05	9.87	1.59	8.28	7.45	0.83	79.26
Crude fiber -----	4.57	5.30	9.87	9.25	0.62	0.31	0.31	5.87
Nitrogen free extract -----	109.15	34.44	143.59	21.19	122.40	95.61	26.79	77.80

TOTALS AND AVERAGES OF CHICKENS T-1, -2, -3, -4, AND -5.

RICE ONLY

	Total Intake grams	Total Outgo grams	Total Assimilation grams	Coefficient
Organic matter -----	225.20	68.00	157.20	69.17
Crude protein -----	21.25	5.72	15.53	73.08
Ether extract -----	5.25	1.05	4.20	80.00
Crude fiber -----	26.50	24.96	1.54	5.81
Nitrogen free extract -----	172.20	36.27	135.93	78.93

CHICKEN U-1. RATION: CORN MEAL $\frac{3}{4}$, KAFIR CORN $\frac{1}{4}$.

	Gr. Corn Meal Intake	Gr. Kafir Corn Intake	Total grams Intake	Total grams Outgo	Total grams Assimilated	Gr. Corn Meal Digested	Gr. Kafir Corn Digested	Coefficient Kafir Corn
Organic matter -----	156.42	52.14	208.56	35.56	173.00	130.16	42.84	82.16
Crude protein -----	16.38	6.54	22.92	6.42	16.50	12.03	4.47	68.40
Ether extract -----	10.08	1.92	12.00	1.89	10.11	8.51	1.60	83.69
Crude fiber -----	5.22	1.80	7.02	6.59	0.43	0.35	0.08	4.19
Nitrogen free extract -----	124.74	41.88	166.62	20.66	145.96	109.27	36.69	87.61

CHICKEN U-2.

Organic matter -----	156.42	52.14	208.56	37.23	171.33	130.16	41.17	78.95
Crude protein -----	16.38	6.54	22.92	6.30	16.62	12.03	4.59	70.18
Ether extract -----	10.08	1.92	12.00	1.09	9.91	8.51	1.40	72.86
Crude fiber -----	5.22	1.80	7.02	6.58	0.44	0.35	0.09	5.13
Nitrogen free extract -----	124.74	41.88	166.62	22.26	144.36	109.27	35.09	83.79

CHICKEN U-3.

Organic matter -----	156.42	52.14	208.56	33.40	170.16	130.16	40.00	76.71
Crude protein -----	16.38	6.54	22.92	6.53	16.39	12.03	4.36	67.21
Ether extract -----	10.08	1.92	12.00	2.11	9.89	8.51	1.38	71.86
Crude fiber -----	5.22	1.80	7.02	6.59	0.43	0.35	0.08	4.81
Nitrogen free extract -----	124.74	41.88	166.62	23.17	143.45	109.27	34.18	81.62

CHICKEN U-4. RATION: CORN MEAL ¾, KAFIR CORN ¼.

	Gr. Corn Meal Intake	Gr. Kafir Corn Intake	Total grams Intake	Total grams Outgo	Total grams Assimilated	Gr. Corn Meal Digested	Gr. Kafir Corn Digested	Coefficient Kafir Corn
Organic matter -----	156.42	52.14	208.56	38.97	169.59	130.16	39.43	75.62
Crude protein -----	16.38	6.54	22.92	6.43	16.49	12.03	4.46	68.26
Ether extract -----	10.08	1.92	12.00	2.14	9.86	8.51	1.35	70.19
Crude fiber -----	5.22	1.80	7.02	6.60	0.42	0.35	0.07	3.98
Nitrogen free extract -----	124.74	41.88	166.62	23.80	142.82	109.27	33.55	80.11

CHICKEN U-5.

Organic matter -----	156.42	52.14	208.56	36.60	171.96	130.16	41.80	80.11
Crude protein -----	16.38	6.54	22.92	6.35	16.57	12.03	4.54	69.49
Ether extract -----	10.08	1.92	12.00	1.96	10.04	8.51	1.53	79.86
Crude fiber -----	5.22	1.80	7.02	6.59	0.43	0.35	.08	4.17

TOTALS AND AVERAGES OF CHICKENS U-1, -2, -3, -4, AND -5.

KAFIR CORN ONLY

	Total Intake grams	Total Outgo grams	Total Assimilated grams	Coefficient
Organic matter -----	260.70	55.46	205.24	78.72
Crude protein -----	32.70	10.28	22.42	68.56
Ether extract -----	9.60	2.34	7.26	75.61
Crude fiber -----	9.00	8.60	0.40	4.45
Nitrogen free extract -----	209.40	34.24	175.16	83.65

CHICKEN V-1. RATION: CORN MEAL $\frac{3}{4}$, BARLEY $\frac{1}{4}$.

	Gr. Corn Meal Intake	Grams Barley Intake	Total grams Intake	Total grams Outgo	Total grams Assimilation	Gr. Corn Meal Digested	Grams Barley Digested	Coefficient Barley
Organic matter	156.42	52.02	208.44	38.20	170.24	130.16	40.08	75.36
Crude protein	16.38	6.54	22.92	5.96	16.96	12.03	4.93	75.36
Ether extract	10.08	1.74	11.82	2.15	9.67	8.51	1.16	66.83
Crude fiber	5.22	3.00	8.22	7.73	0.49	0.35	0.14	4.71
Nitrogen free extract	124.74	40.74	165.48	22.36	143.12	109.27	33.85	83.10

CHICKEN V-2.

Organic matter	156.42	52.02	208.44	39.96	168.48	130.16	38.32	73.66
Crude protein	16.38	6.54	22.92	6.30	16.62	12.03	4.59	70.14
Ether extract	10.08	1.74	11.82	2.23	9.59	8.51	1.03	61.93
Crude fiber	5.22	3.00	8.22	7.75	0.47	0.35	0.12	3.98
Nitrogen free extract	124.74	40.74	165.48	23.68	141.80	109.27	32.53	79.87

TOTALS AND AVERAGES FOR CHICKENS V-1, AND 2.

BARLEY ONLY

	Total Intake grams	Total Outgo grams	Total Assimilated grams	Coefficient
Organic matter	104.04	25.64	78.40	75.35
Crude protein	13.08	3.56	9.52	72.77
Ether extract	3.48	1.24	2.24	64.36
Crude fiber	6.00	5.74	0.26	4.33
Nitrogen free extract	81.48	15.10	66.38	81.46

CHICKEN W-1. RATION: CORN MEAL $\frac{3}{4}$, WHEAT MIDDINGS $\frac{1}{4}$.

	Gr. Corn Meal Intake	Gr. Wheat Middings Intake	Total grams Intake	Total grams Outgo	Total grams Assimilation	Gr. Corn Meal Digested	Gr. Wheat Middings Digested	Coefficient Wheat Middings
Organic matter-----	156.42	51.84	208.26	48.33	159.93	130.16	29.77	57.42
Crude protein-----	16.38	10.14	26.52	6.87	19.65	12.03	7.62	75.18
Ether extract-----	10.08	3.06	13.14	2.52	10.62	8.51	2.13	69.61
Crude fiber-----	5.22	5.10	10.32	9.78	0.54	0.35	0.19	3.69
Nitrogen free extract-----	124.74	33.54	158.28	29.18	129.10	109.27	19.83	59.12

CHICKEN W-2.

Organic matter-----	156.42	51.84	208.26	46.39	161.87	130.16	31.71	61.16
Crude protein-----	16.38	10.14	26.52	6.40	20.12	12.03	8.09	79.82
Ether extract-----	10.08	3.06	13.14	2.40	10.74	8.51	2.23	73.18
Crude fiber-----	5.22	5.10	10.32	9.75	0.57	0.35	0.22	4.27
Nitrogen free extract-----	124.74	33.54	158.28	27.84	130.44	109.27	21.17	63.13

CHICKEN W-3.

Organic matter-----	156.42	51.84	208.26	46.64	161.62	130.16	31.46	60.66
Crude protein-----	16.38	10.14	26.52	6.60	19.92	12.03	7.89	77.81
Ether extract-----	10.03	3.06	13.14	2.36	10.78	8.51	2.27	74.26
Crude fiber-----	5.22	5.10	10.32	9.76	0.56	0.35	0.21	4.12
Nitrogen free extract-----	124.74	33.54	158.28	27.92	130.36	109.27	21.09	62.89

TOTALS AND AVERAGES FOR CHICKENS W-1, -2, AND -3.

WHEAT MIDDINGS ONLY

	Total Intake grams	Total Outgo grams	Total Assimilated grams	Coefficient
Organic matter	155.52	62.58	92.94	59.78
Crude protein	30.42	6.82	23.60	77.57
Ether extract	9.18	2.55	6.63	72.22
Crude fiber	15.30	14.68	0.62	4.05
Nitrogen free extract	100.62	38.53	62.09	61.70

MONOGRAPHIC TABLES OF
DIGESTIVE COEFFICIENTS WITH POULTRY

COMPOSITION OF POULTRY FEEDS—ALL ANALYSES TO DATE

TABLE VII

Feed	Water	Ash	Crude Protein	Fiber	N.F.Ex	Fat	No. Analysis
Barley	9.31	2.70	11.49	4.59	69.82	2.11	302
Buckwheat	11.90	2.21	10.84	10.10	62.24	2.71	21
Clover, red (Green)	73.80	2.10	4.10	7.30	11.70	1.00	85
Corn	12.01	1.51	10.39	1.80	69.28	5.01	58
Corn, cracked*	10.29	1.61	10.30	2.00	70.79	5.01	5
Corn meal, bolted*	13.13	1.23	10.10	1.79	68.10	5.65	6
Corn meal, unbolted*	11.10	2.00	9.10	2.90	69.30	5.60	4
Corn meal	11.30	1.30	9.30	2.30	72.00	3.80	7
Cottonseed meal	7.91	6.40	37.60	11.50	23.37	8.20	486
Cowpeas	11.60	3.40	23.60	4.10	55.80	1.50	11
Oats	9.21	3.41	12.39	10.10	61.50	3.39	498
Oats, hulled*	8.29	3.10	13.90	1.90	64.20	8.70	5
Oats, rolled	7.90	2.00	16.00	1.50	66.10	6.50	8
Kafir corn	11.35	1.78	11.02	2.33	70.52	3.00	141
Millet	9.10	3.30	11.80	7.80	64.70	3.30	6
Potatoes, raw	78.80	1.10	2.20	0.40	17.40	0.10	465
Peanut meal (Fat not extraeted)* ..	6.10	4.90	21.30	16.60	15.50	35.60	4
Peas	9.20	3.40	22.90	5.60	57.80	1.10	6
Rice	9.33	5.05	7.78	9.60	66.34	1.90	16
Rye	9.43	2.00	11.80	1.86	73.10	1.81	112
Soybean meal	11.12	5.38	41.66	5.46	23.90	7.48	10
Wheat	10.20	1.90	12.41	2.20	71.19	2.10	864
Wheat bran	10.10	6.30	16.00	9.50	53.70	4.40	7,742
Wheat middlings*	9.29	4.24	15.72	7.15	59.00	4.50	10
Meat scrap	7.50	16.60	59.30	-----	5.00	11.60	31
Blood meal	9.64	3.34	82.38	-----	3.77	0.87	50
Buttermilk (dried)*	10.12	6.42	34.16	-----	48.31	0.99	4
Fish meal*	9.70	31.10	49.30	-----	-----	9.90	4
Meat and bone meal	5.90	36.36	39.69	2.09	4.89	11.37	63
Digester tankage	7.42	19.29	52.15	3.11	4.03	14.00	57

*Analyses by Kaupp and Ivey, only.

KAUPP-IVEY TABLE

SHOWING AVERAGE DIGESTIVE COEFFICIENTS, FOR POULTRY, TO DATE
TABLE VIII

Feed	Number of Trials	Organic Matter	Crude Protein	Fat	Fiber	Nitrogen Free Extract
Wheat middlings	18	52.55	64.52	53.59	8.45	54.81
Corn	18	86.43	81.05	83.23	5.86	90.55
Wheat	16	80.68	69.82	48.78	6.40	87.73
Oats	19	63.52	73.83	80.22	11.69	74.37
Corn meal (boltcd)	5	84.67	74.04	86.26	6.66	88.18
Meat and bone meal	2	86.82	92.17	93.13	3.23	76.56
Tankage	2	85.50	90.70	91.71	3.94	81.88
Blood meal	4	86.71	88.10	78.36	-----	71.55
Buttermilk (dried)	5	80.79	81.55	78.01	-----	81.14
Soybean meal (Fat extracted)	5	77.61	83.33	81.41	2.16	83.14
Peanut meal (Fat not extracted)	5	65.94	80.33	78.41	4.08	84.14
Cottonseed meal	4	73.32	81.94	79.05	5.46	82.92
Corn meal (unboltcd)	3	83.21	73.50	84.50	6.80	87.60
Rye	4	77.65	71.56	25.05	4.68	84.19
Hulled oats	5	81.75	69.83	84.57	4.91	86.22
Buckwheat	8	70.14	56.79	85.09	6.33	82.69
Rice	5	69.17	73.08	80.00	5.81	78.93
Kafir corn	11	83.50	68.56	76.96	4.45	90.60
Barley	5	76.46	75.90	66.45	4.33	84.52
Corn, cracked	2	83.30	72.20	87.10	-----	88.10
Wheat bran	3	46.70	71.70	37.00	-----	46.00
India wheat	3	72.70	75.00	83.80	-----	83.40
Oats, rolled	4	89.30	80.10	92.20	-----	94.30
Peas	3	76.60	88.10	81.20	-----	87.10
Cowpeas	6	71.90	-----	88.70	-----	87.50
Millet	2	-----	62.40	85.70	-----	98.40
Potatoes	6	78.30	46.90	-----	-----	84.50
Beef scrap	4	83.60	91.40	91.00	-----	-----
Fish meal	5	91.60	91.48	92.24	-----	-----
Corn meal	5	84.20	74.60	89.90	-----	89.30
Clover, (calculated)	3	27.70	70.60	35.50	-----	14.30

KAUPP-IVEY TABLE OF AVERAGE DIGESTIBLE NUTRIENTS OF POULTRY FEEDS

Based on digestive experiments with poultry as determined by B. F. Kaupp and J. E. Ivey, N. C. Experiment Station, Brown, U. S. Department of Agriculture, Bartlett, Maine Experiment Station, Fields and Ford, Oklahoma Experiment Station, and Paraschtschuk, Kaluginand, and Grost.

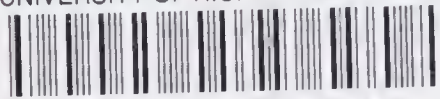
TABLE IX
DIGESTIBLE NUTRIENTS IN 100 POUNDS

Feed	Total Dry Matter	Crude Protein	Fiber	Nitrogen Free Extract	Fat	Total Pounds
Barley.....	90.69	8.70	0.18	58.94	1.40	69.22
Buckwheat.....	88.10	6.14	0.64	51.47	2.30	60.55
Clover, red (green).....	16.20	2.89	-----	1.67	0.35	4.91
Corn.....	87.81	8.42	0.10	62.73	4.17	75.42
Corn, cracked.....	89.71	7.44	-----	62.54	4.36	74.34
Corn meal, bolted.....	86.87	7.47	0.12	60.05	4.87	72.51
Corn meal, unbolted.....	88.90	6.69	0.19	60.53	4.73	72.14
Corn meal.....	88.70	6.93	-----	64.30	3.41	74.64
Cottonseed meal.....	92.09	27.63	0.78	23.54	6.93	58.88
Cowpeas.....	88.40	-----	-----	48.82	1.33	50.15
Oats.....	80.79	9.77	1.28	45.73	2.72	59.50
Oats, hulled.....	91.80	9.70	0.09	55.35	7.36	72.50
Oats, rolled.....	92.10	12.82	-----	62.33	5.99	81.14
Kafir corn.....	88.65	7.56	0.10	63.89	2.31	73.86
Millet.....	90.90	7.36	-----	63.66	2.83	73.85
Potatoes.....	21.20	1.03	-----	14.71	-----	15.74
Peanut meal (Fat not extracted).....	93.90	17.11	0.68	13.04	27.91	58.74
Peas.....	90.80	20.17	-----	50.34	0.89	71.40
Rice.....	90.67	5.69	0.56	52.36	1.52	60.13
Rye.....	90.57	8.44	0.09	61.54	0.46	70.53
Soybean meal (Fat extracted).....	88.88	34.71	0.11	24.02	6.09	64.93
Wheat.....	89.80	8.66	0.14	62.45	1.02	72.27
Wheat bran.....	89.90	11.47	-----	24.70	1.63	37.80
Wheat middlings.....	90.71	10.14	0.60	32.33	2.41	45.48
Meat meal.....	92.50	54.20	-----	-----	10.56	64.76
Blood meal.....	90.26	72.58	-----	2.70	0.68	75.96
Buttermilk (dried).....	89.88	27.86	-----	39.20	0.77	67.83
Fish meal.....	90.30	45.10	-----	-----	9.13	54.23
Meat and bone meal.....	94.10	36.58	0.07	3.74	10.59	50.98
Digester tankage.....	92.58	47.30	0.09	3.08	12.84	63.31

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